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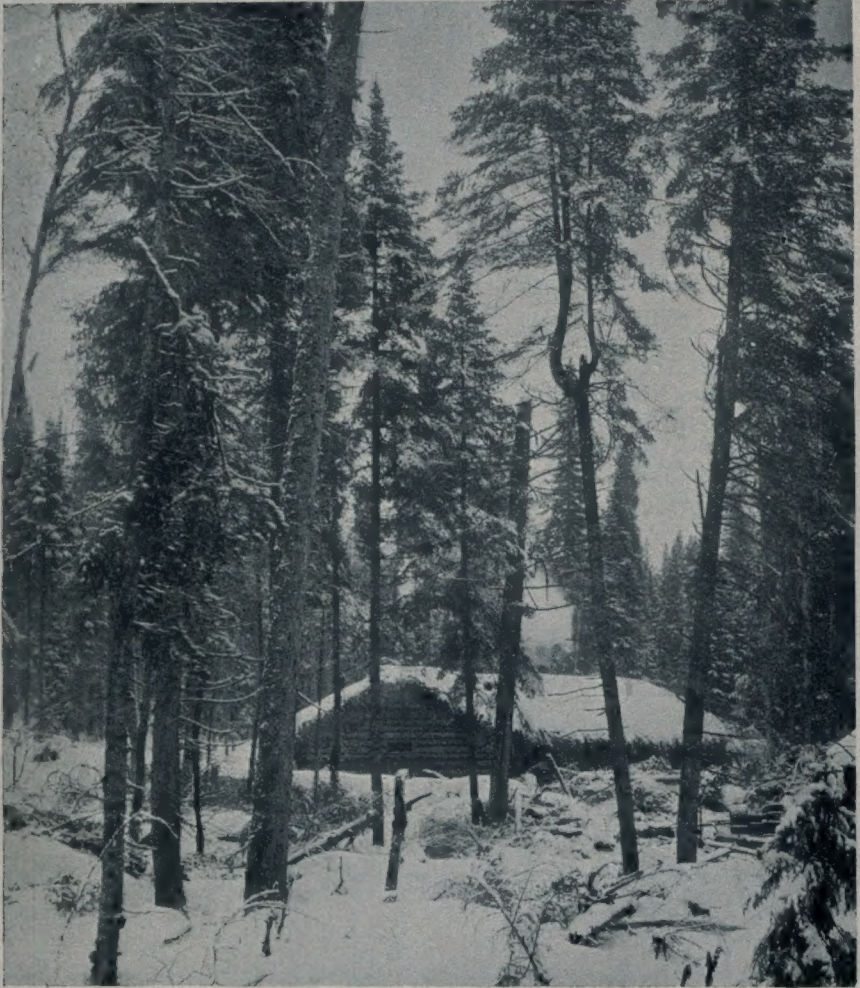
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Canadian Forestry Journal



A NEW BRUNSWICK LUMBER CAMP.

APRIL 1910

Canadian Forestry Journal

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Canadian Forestry Journal

VOL. VI.

APRIL, 1910.

No. 1.

THE CONSERVATION CONVENTION.

The convention for the consideration of forestry and other conservation problems, announced some time ago, is definitely announced to be held during the second week in June, at some point in the province of Quebec, probably either in the City of Quebec or in the City of Montreal. The

convention will be held in connection with the second meeting of the Commission of Conservation and a large number of those most familiar with, and interested in, the problems of Canadian forestry will be present.

THE ANNUAL BUSINESS MEETING.

The eleventh annual meeting of the Canadian Forestry Association was held on Thursday, March 10th, 1910, at the office of the Superintendent of Forestry, Ottawa. In the absence of the President, Mr. Thos. Southworth, the chair was taken by the Vice-President, Senator W. C. Edwards. Among those present were Messrs. W. Little, Westmount, and E. Stewart, Montreal, ex-presidents of the Association; Dr. B. E. Fernow, Toronto; Messrs. Ellwood Wilson, Grand Mere, Que.; G. C. Piché, Quebec; Frank Davison, Bridgewater, N.S.; Dr. Wm. Saunders, Frank Hawkins, Prof. John Macoun, J. M. Macoun, A. C. Campbell, L. H. Newman, G. S. Proctor, E. F. Drake, R. Patching, and F. W. H. Jacombe, Ottawa, and Secretary Lawler, of Toronto.

Shortly after the opening of the meeting a telephone communication was received from the President, to the effect that it would be impossible for him to be present; owing to having missed a connection on a return trip from Cobalt, he had only that morning reached Toronto. Letters expressing regret at inability to be present were also received from Messrs. H. M. Price and E. G. Joly de Lotbiniere, of Quebec; J. B. Miller and J. O. Thorn, of Toronto, and Mr. G. Y.

Chown, of Kingston. A verbal message was also conveyed from Mr. R. H. Campbell, Superintendent of Forestry.

The minutes of the last meeting and those of the conventions at Regina and Fredericton were, on motion, taken as read.

DIRECTORS' REPORT.

The Secretary then presented the annual report of the Directors. After noting the election of territorial vice-presidents, the report briefly reviewed the conventions at Regina and Fredericton. The appointment of the permanent secretary was referred to, and the work performed by him in connection with the two conventions and also in his lecture tours. The grants from the Dominion and Provincial Governments (Ontario, Quebec, New Brunswick and British Columbia) and their probable continuance were also discussed.

To the banks which have assisted in the work of the Association by making a number of their managers members of the organization (viz., the Bank of Montreal, Bank of Commerce, Molsons' Bank and the Merchants' Bank), had been added the Bank of New Brunswick; this had been effected by the Secretary during

his late visit to New Brunswick. The Bank of British North America also had encouraged its managers to become members of the Association.

The balance to the credit of the Association was \$2,561.10, the receipts during the year having been \$6,856.45 and the expenditure \$4,295.35.

The total number of members was 2,471, an increase during the year of 566; this total, however, included a number of members in arrears and a revision of the list would probably reduce the number somewhat.

The JOURNAL had appeared quarterly with an average issue of about 2,750 copies, the surplus copies having been distributed to probable members of the Association. Of the English edition of the annual report 3,000 copies had been issued, and of the French edition 2,000. In connection with the preparation and printing of the latter the thanks of the Association were due to Mr. G. C. Piché, of the Department of Lands and Forests of Quebec. The newspaper bulletins had also been continued.

The publication by the Forestry Branch of statistics of the timber production of the Dominion and the organization of the Commission of Conservation were also referred to.

On motion the report was received and adopted.

Reports were also presented by the Asst. Secretary and the Treasurer and were received and adopted.

It was decided to change the date of the annual meeting from March to February, to increase the number of directors from fifteen to twenty-one, and to make past presidents from (and including) 1909-1910 ex-officio directors.

The Secretary was instructed to get data regarding the formation of provincial branches and also regarding the publication of the JOURNAL monthly. He was also instructed to write Msgr. J. C. K. Laflamme and Mr. Hiram Robinson, expressing the sympathy of the members of the Association with them in their illness.

The following were elected a com-

mittee to study the possibility of a general log rule for the whole Dominion: Dr. Fernow, Dr. Judson Clark, Messrs. Ellwood Wilson, G. C. Piché, and Alex. MacLaurin.

The following were elected as a committee to consider the fire laws of the Dominion and the several provinces and to suggest legislation that would in their opinion more effectively prevent and control forest fires: Dr. Fernow, Mr. Southworth, Mr. W. C. J. Hall, Dr. Judson Clark, Mr. Piché, Mr. Davison and Mr. Ellwood Wilson.

Resolutions were passed expressing satisfaction at the formation of the Commission of Conservation and reaffirming the position taken last year, upon motion of Prof. W. T. MacClement, of Queen's University, and Mr. A. Bergevin, of Montreal, as to the need of text books for schools. Mr. G. Y. Chown, of Kingston, gave notice of a motion for the next annual meeting to the effect that the Association employ a technically trained forester.

The following resolutions passed at the annual convention in Fredericton were confirmed:—

"That the Canadian Forestry Association endorse the project set forth in the report of the Parliamentary Committee of the House of Commons recommending that the available forest land upon the eastern slope of the Rocky Mountains be constituted a permanent forest reserve.

"That in the opinion of the Canadian Forestry Association the governments of the Dominion and the several provinces should reserve to Canada all the waterpowers within their boundaries, especially those in waters bordering on the neighboring republic.

"That in the opinion of the Canadian Forestry Association the Dominion government should pass more stringent laws to compel railway companies to take more precautions to prevent forest fires along the lines of their railways, and also that the Intercolonial Railway and the Prince Edward Island Railway should be

placed in the same position as other railways and compelled to conform to the fire laws of the several provinces through which they pass.

"That the Canadian Forestry Association would urge upon the Dominion government and the governments of the several provinces the necessity of reserving the timber lands at the headwaters of rivers and streams so as to maintain an even flow of water.

"That the Association would recommend that the various provinces cause the existing forest reserves, and those to be created, to be of an absolutely permanent character, so far as actual forest land is concerned."

ELECTION OF OFFICERS.

The election of officers was then proceeded with and resulted as follows:—

Patron, His Excellency the Governor-General.

Honorary President, Sir Wilfrid Laurier.

President, Hon. W. C. Edwards.

Vice-President, G. Y. Chown.

Secretary, Jas. Lawler.

Asst. Secretary, F. W. H. Jacombe.

Treasurer, Miss Marion Robinson.

Directors, Wm. Little, Hiram Robinson, E. G. Joly de Lotbiniere, E. Stewart, H. M. Price, Hon. Sydney Fisher, R. H. Campbell, Mgr. J. C. K. Laflamme, W. B. Snowball, J. B. Miller, W. A. Charlton, Gordon C. Edwards, Dr. B. E. Fernow, Ellwood Wilson, R. L. Borden, Aubrey White, A. P. Stevenson, F. C. Whitman, G. C. Piché, A. McLaurin, Carl Riordon and Thos. Southworth.

THE FREDERICTON, 1910, CONVENTION.

"I have attended many conventions of the Canadian Forestry Association in the years of its existence, and I think I am safe in saying I never attended such a successful convention as this one."

In these words did Hon. Senator Edwards, the Chairman, describe the Fredericton Convention in his closing remarks to the delegates and this was the feeling of others who were in a position to speak.

When Fredericton was selected as the place for the Convention of 1910 there were many who feared a mistake had been made, and that but a poor attendance and small interest would result. But the event proved that not only did many delegates attend from different parts of Canada and the United States, but it demonstrated, particularly, how much aroused are the people of New Brunswick, for delegates came from every part of the province. Perhaps the fact that twelve million acres out of a total of somewhat more than seventeen million acres in the province are still under forest accounts

for the interest which men of all businesses and professions feel in forestry. From Nova Scotia also came a large delegation.

The time had been well chosen by the Government of New Brunswick, upon whose invitation the convention was held, as, owing to the opening of the Legislature and the holding of a series of agricultural conventions, as well as the forestry convention, Fredericton was the centre of interest for the week. The only difficulty was that of hotel accommodation, and this was gotten over by calling upon the people of the city for rooms in their residences, a call to which they generously responded.

The sessions of the convention were held in the handsome Legislative Chamber of the Provincial Parliament Buildings, Parliament being adjourned for the two days of the convention. This proved an ideal place for such a gathering. The delegates were seated on the floor of the House in which, in addition to the seats of the members, a large number of chairs had been placed, while the galleries

were occupied by visitors, among whom there was always a good sprinkling of ladies.

THE OPENING.

The convention was opened by His Honor Lieut.-Governor Tweedie, who from his intimate knowledge of forest conditions was able to direct the delegates to the chief points before them in an admirable brief address.

The chair at the opening session was occupied, in the absence of the President, Mr. Thomas Southworth,

ship C. Fred Chestnut, Mayor of Fredericton. Over one hundred and ninety delegates signed the record of attendance. The names will be found at the conclusion of this article.

Owing to the fact that the papers and discussions at the convention will appear in the annual report, which will be issued to members as soon as possible, only the briefest outline is given here.

HIS HONOR THE LIEUT.-GOVERNOR.

His Honor the Lieut.-Governor, in



The Provincial Parliament Buildings in Fredericton, N.B.

of Toronto, by Hon. W. C. H. Grimmer, Surveyor-General of New Brunswick, and Vice-President of the Association for the province. Hon. Senator Edwards, Vice-President of the Association, arrived in time for the opening of the afternoon session, when those on the platform in addition to those already named were: Hon. Clifford Sifton, Chairman of the Commission of Conservation; Hon. J. D. Hazen, Premier of New Brunswick; Hon. Clifford W. Robinson, leader of the Opposition, and his Wor-

opening the meeting and welcoming the delegates, said the interest in the forests had been aroused not a moment too soon, seeing how much depended upon them—timber, agriculture and stream flow. Because of indifference and apathy in the past great tracts worth millions to the province had been devastated by fire and improper cutting. Where permanent improvements were made it was right that posterity should help in paying for them; and conversely posterity had a right to ask that such

assets as these should be protected. There was a cry "Back to the Farm." That was right, but it needed to be amended to read "Back to the Farm and Protect the Forests."

Letters of regret were read from a number of representative citizens who were unable to be present. Among these were letters from His Excellency the Governor-General; Rt. Hon. Sir Wilfrid Laurier; Mr. R. L. Borden, M.P.; Mr. Gifford Pinchot, and Dr.

and individually."

ADDRESSES OF WELCOME.

Hon. J. D. Hazen, Premier of New Brunswick, in his address of welcome, noted that, having regard to the proportionate amount of land devoted to forests, as compared with farms, no province in the Dominion was more interested in the lumber industry than New Brunswick. He called attention to the fact that when the present



The Legislative Chamber, in which the sessions of the convention were held.

B. E. Fernow. The President, Mr. Thomas Southworth, in his letter of regret, reviewed the work of the year and urged the appointment of a committee to consider the fire laws of the several provinces.

Sir Wilfrid Laurier wrote: "The forestry question is one which by associations, by meetings, by lectures and by every possible method should be presented to the ever close attention of the Canadian public, collectively

Deputy-Surveyor-General of New Brunswick, Lieut.-Col. T. G. Loggie, entered the Crown Lands office the revenue was only \$25,000 per year while to-day it was \$400,000; and there was no reason why, with proper care, the forests should not provide an increasing source of revenue for all time. The value of forests in attracting tourists was noted, as was also the fact that by the application of game laws the forests of the province

were full of moose and elk, whereas these animals were almost extinct a century ago, according to writers of that time.

Mr. Clifford W. Robinson, and Mayor Chestnut, of Fredericton, also warmly welcomed the delegates, and short addresses were delivered by representative men as follows:—

REPRESENTATIVES SPEAK.

Mr. Irvin C. Williams, Deputy Commissioner of Forestry of Pennsylvania, said that in Pennsylvania about a million acres of land were held by the state for economic and scientific forestry. To care for these lands there was an academy to educate young men, and to protect forest lands from fire a fire law was passed in 1909. This placed the matter wholly in the hands of the Department of Forestry. An outgrowth of this work was the Health Department which was caring for tuberculous patients by sending them to the mountain regions, while the people were allowed to use these reserves as health-giving camping grounds.

Hon. B. F. Pearson, of Halifax, spoke for Nova Scotia, Mr. James M. Macoun told of the work of the Geological Survey in securing information about the resources of northern Canada, and Mr. H. J. P. Good, Manager of the Dominion Exhibition, St. John, also spoke briefly.

EDUCATIONAL ASPECT OF FORESTRY.

The reading of papers was then taken up, the first being that of Dr. Cecil C. Jones, Chancellor of the University of New Brunswick, on "The Educational Aspect of Forestry." Dr. Jones held that education was necessary in order to secure the right kind of laws and regulations. As showing what other countries were doing he reviewed the work in Germany, Austria, Switzerland, France, Russia, Sweden, Italy, Great Britain, India and the United States. Canada had made a beginning in the general dissemination of knowledge through the Canadian Forestry Association,

and in the training of young men at the University of Toronto and the University of New Brunswick. She needed to develop the scientific study of forestry in institutions and in selected forest areas. Canada also needed to bring this work into the elementary schools through the enlargement of the scope of nature study. Arbor Day should be given its intended place and to this end he suggested the preparation of a small pamphlet to be sent to the teachers of primary schools.

THE COURSE IN FORESTRY.

Mr. R. B. Miller, Professor of Forestry in the University of New Brunswick, read a paper entitled "The Forestry Course in a Lumbering Region." Prof. Miller sketched the course in the Department of which he is the head, and pointed to the advantages this school had in the nearness of logging and driving operations, and in the possession by the University of land near by, suitable for forestry work by the students. The point where care must be exercised was that of dividing the work fairly between the practical and theoretical sides.

FORESTRY IN NOVA SCOTIA.

Mr. F. C. Whitman, of Annapolis Royal, N.S., President of the Lumbermen's Association of Western Nova Scotia, dealt with "Forestry in Nova Scotia." People were now beginning to realize that conservation was a commercial proposition. The solution of the forestry problem lay, he believed, in the fixing of incontrovertible values for forest land. If this were done a credit would be established that would obviate the necessity of sacrificing timber by lumbermen. He spoke of the new Fire Act worked out by the lumbermen and the government in co-operation, and he also dealt at considerable length with the reconnaissance survey of Nova Scotia timber areas now being carried on by Dr. Fernow and his assistants.

These papers were discussed at considerable length by Dr. G. U. Hay, Mr. Ellwood Wilson, Mr. W. B. Snowball, Mr. G. F. Hill, Mr. Whitman, Hon. J. D. Hazen, Hon. W. C. H. Grimmer, and Prof. Miller. Mr. Hazen dealt with the fire danger in New Brunswick, particularly in regard to the government railways. The rate of growth of trees in New Brunswick was also keenly debated.

WEDNESDAY AFTERNOON.

Senator W. C. Edwards, Vice-President, took the chair in the afternoon, and filled the post during the remainder of the convention in a way that made things go with a swing. After congratulating the people of New Brunswick upon the size and character of the gathering, he introduced Hon. Clifford Sifton, Chairman of the Commission of Conservation, who spoke on the relation of that body to the objects of the Canadian Forestry Association. The Chamber was filled, both floor and galleries, with a most attentive audience of ladies and gentlemen.

HON. CLIFFORD SIFTON.

Hon.^d Mr. Sifton confessed to a feeling of surprise at the large audience. He had expected to speak to fifteen or twenty gentlemen, but he did not complain. On the contrary anything of value he had to say would be more effective because of the large number present. He first showed the progress made in forestry in Canada in the last ten years. Ten years ago he, as Minister of the Interior, had had fifteen thousand dollars placed in the estimates to establish a Forestry Branch. This was opposed on both sides of the House as a fad, and he was told that there was not one competent forester in Canada to do scientific forestry work. The change since then in the interest in this subject was due in a large measure to the campaign of the Canadian Forestry Association. He went on to enumerate some of the recent progressive movements. British Columbia was

reorganizing its sale methods, the Dominion Department of the Interior had set aside a large number of timber reserves, which were being protected and developed; in Ontario there was a very complete fire system and large areas had been set apart for reserves; Quebec had reserves, a fire-ranger system and had sent men to Europe to study protection there; and New Brunswick and Nova Scotia were also moving in regard to forest protection. The Commission of Conservation would as far as possible assist and cooperate with the Canadian Forestry Association in carrying on its work to arouse interest and promote scientific forestry. The Commission could act only in an advisory capacity, and in order that its findings might have value they must be backed by public opinion, which it was the work of the Association to create. The chief danger to the forest was fire, particularly among the young growth. The danger from railways was referred to and the aims of the Commission to have government railways brought under the same laws as other railways noted. Cutting away of the the forests did affect climatic conditions and it particularly affected the flow of rivers, as seen in a striking instance in the Grand Rive. in Ontario.

Careful calculations showed that the supply of timber in the United States would not last, at the present rate of consumption, more than thirty years; and should the United States have to look to Canada for timber our forests would last but seven years. Within the lifetime of those before him the governments would be compelled to limit the amount cut. He commended the Ontario regulations prohibiting the export of unmanufactured logs or pulpwood cut on Crown Lands, and also the proposal of Quebec to the same effect, and hoped New Brunswick would fall into line. He favored a permanent tenure to the lessees of timber limits, as opposed to short term leases. He advocated the formation of a forest



Senator W. C. Edwards, President of the Canadian Forestry Association, 1910-1911,
and Chairman of the Forestry Committee of the Canadian Commission
of Conservation. He presided over the Fredericton Convention.

reserve on the eastern slope of the Rocky Mountains and opposed the proposal to dam the St. Lawrence at the Long Sault Rapids, which was, he felt, not in the interest of Canada, and he asked the Association to oppose it also.

LUMBERING ON THE MIRAMICHI.

Mr. J. P. Burchill, M. P. P., of Nelson, N. B., whose family have been lumbering in New Brunswick for several generations, read a paper on "Lumbering on the Miramichi." He traced the history of lumbering for over a hundred years from the time of masts and squared pine timber down through the ship-building period to the present stage of deals and spool wood. Destruction by fire and cutting had greatly exceeded the natural growth, as shown by the decreased sizes of material now being taken out. He held that the export of pulpwood resulted in a heavy drain on the forest in proportion to the amount of labor employed, and contrasted with this the large amount of skilled labor required in a paper mill now operating on the Miramichi for the small quantity of timber used.

THE PULPWOOD QUESTION.

Hon. Charles E. Oak, of Bangor, Maine, and Manager of the Miramichi Lumber Company, of Chatham, discussed "The Pulpwood Question in New Brunswick" in a long paper. He said that when timber was cut for pulpwood eighty per cent. of the tree was taken out of the woods, while for lumber but from sixty to sixty-five per cent was taken out. Neither deal nor pulpwood was a finished product and there would be as much reason in prohibiting the export of the one as the other. He held that it would be impossible to force paper mills to come to New Brunswick by prohibiting the export of pulpwood, because New Brunswick lacked the waterpowers necessary to produce "ground wood." It took three hundred horse power to run one grinder producing four tons of pulp per day.

Coal cost \$4.50 laid down at Chatham and this gave a cost for coal alone of \$8.44 per ton of pulp, which was impossible with pulp selling at \$17.50 per ton.

PULPWOOD DISCUSSED.

Mr. W. B. Snowball, of Chatham, in reply, read from the statement of the International Paper Company before the United States Ways and Means Committee in the tariff enquiry. This was to the effect that that company employed, all told, over fifteen thousand persons in the mills and woods operations, that 35 per cent. of the company's wood came from Canada, and, further, that the taking off of the duty on paper or the shutting out of raw material would drive them out of business or compel them to build mills in Canada. Mr. Snowball's idea was that Canada should so handle her resources as to develop her industries and provide employment for Canadians. As to the impossibility of making pulp in New Brunswick he pointed to the mills on the Miramichi, and also to sulphite pulp mills in Ontario which were run by steam. Ground wood might be made at Grand Falls and sulphite in other parts of the province. As to the price of coal the price at Chatham was \$1.85 per ton for the kind of coal the mills used.

Senator Edwards asked Hon. Mr. Grimmer to take the chair, and then joined in the discussion. He thought it would be a mistake for Canada to prohibit the export of pulpwood. The pulp mills would come to Canada automatically, and no legislation would hasten the process.

WEDNESDAY EVENING.

On Wednesday evening a reception was tendered the delegates by His Honor Lieutenant-Governor Tweedie and Mrs. Tweedie, Hon. J. D. Hazen and Mrs. Hazen and the members of the Executive Council. The reception, which was held in the Legislative Chamber, was a most successful and delightful function. The rooms were

handsomely decorated with bunting, flowers and palms. Large numbers attended and spent a most enjoyable evening.

THURSDAY MORNING.

Proceeding on the plan of Wednesday morning there were first a number of short addresses.

Mr. W. R. Brown, Secretary of the New Hampshire Forest Commission, and Prof. E. J. Zavitz, of the Ontario Agricultural College, Guelph, brought greetings from their respective bodies.

Mr. A. B. Warburton, M.P., spoke for Prince Edward Island and made special reference to the sand dunes there in areas that he was convinced had been once covered with forest. The Government should make an experiment in reforesting them.

FORESTRY IN QUEBEC.

Mr. G. C. Piché, Chief Forest Engineer, Department of Lands and Forests, Quebec, spoke on behalf of Hon. Jules Allard, Minister of Lands and Mines, who was unable to attend. The work of supervising the cutting in Quebec which had been organized by Mr. A. Bedard and himself was being enlarged. They now supervised the operations in half the province. They had fifteen student assistants, besides rangers. While he felt more could be done by protecting the forest than by planting, still they were supplying young trees for this purpose and from the forest nurseries at Berthierville about half a million trees per year were sent out. He favored having branches of the Association in the different provinces, and a general log rule for the whole Dominion.

DOMINION FOREST RESERVES.

Mr. Abraham Knechtel, Inspector of Dominion Forest Reserves, told of the work being carried on by the Dominion Forest Service in the prairie province and in the forty-mile belt along the Canadian Pacific Railway in British Columbia, all of which comes under the control of the Do-

minion Government. The work fell into three classes: the forests, the forest reserves and tree planting. In the forests the chief work was the protection from fire and the overseeing of the work of cutting. On the reserves there was the protection from fire by patrol, by plowing and burning fire-guards, by opening up fire roads and by clearing the forest floor of debris. This latter was accomplished by allowing the settlers to take out only the "dead-and-down" wood. Young trees for planting were furnished free to the settlers, and last season about two and a half million trees were sent out. This tree planting was rapidly improving the appearance and comfort of the prairie homesteads.

The work of the session was then taken up and three papers were read on the subject of fire protection viewed from different standpoints.

FIGHTING FIRE IN QUEBEC.

Mr. W. C. J. Hall, Superintendent of the Bureau of Forestry, Quebec, held that the great duty before the people of Canada was to lessen the enormous fire loss. The first thing was to efface by literature, lectures and all other means the idea now prevalent in the popular mind that the forests must be destroyed to make room for agriculture. Next an efficient patrol must be provided. The danger points were the railway lines and the new settlements. Mr. Hall went into the subject most carefully, citing instances to illustrate his points and referring to equipment, plans, mountain look-outs, telephone service, etc., and the cost of these various aids.

NEW HAMPSHIRE'S FIRE LAW.

Mr. W. R. Brown, Secretary of the Forestry Commission of New Hampshire, told of the forest fire law passed there in 1909. This placed fire protection under the control of the Forestry Commission, which appointed a state forester, who, in turn, appointed some 230 deputies who covered the

state. These called out men when needed to fight fires, the cost being borne, one-half by the municipality and one-half by the state. A beginning had been made in regard to mountain look-out stations. The law should be improved by putting more emphasis on prevention. Plans of co-operation between the state and the timber-owners should be worked out, and the mountain look-outs should be increased and supplemented by a fire patrol.

NEW BRUNSWICK'S EXPERIENCE.

Mr. H. W. Woods, M.P., of Welsford, N.B., divided the fire dangers into four classes; viz.: those from railways, tourists, settlers and blueberry burnings. The railways were learning that burned areas gave them no traffic and were becoming more careful. Tourists must be kept under better surveillance by the licensed guides. People must be taught how properly to cultivate the blueberry, and settlement should be concentrated along transportation lines and settlers kept out of timber districts.

All three papers contained a number of most practical suggestions for fighting fire. This led to an animated discussion as to the best times and methods for combatting a fire once it got started. Those who took part included Senator Edwards, Mr. Robt. Connelly, Mr. G. F. Hill, Mr. I. C. Williams, Mr. W. R. Brown, Mr. Whitman and Mr. Knechtel.

Mr. Williams told of the efficiency of the water pack-saddle used in Pennsylvania. This holds two fifteen-gallon kegs of water to which a pump and hose may be attached.

Mr. Knechtel said they were using water sacks in the west for men on horseback, and Mr. Brown showed the good results which followed the installation of oil-burning locomotives on railways in forest districts.

REFORESTATION IN ONTARIO.

Prof. E. J. Zavitz, B.A., M.S.F., of the Ontario Agricultural College, Guelph, dealt with "Reforestation in

Ontario." In southern Ontario less than ten per cent. of the land was in trees, and in many townships less than five per cent. To provide farmers with material to plant up their woodlots a nursery had been established and the demand was growing as rapidly as the supply. He spoke of the work in Norfolk County, where the Ontario Government had purchased one thousand acres of blow-sand land and was putting it back into forest as an example. In southern Ontario he estimated there were two hundred square miles of unproductive sand lands, about forty per cent. of which would require re-stocking. While artificial re-stocking would not receive much attention for some time to come in Canada, still on large areas where the desired variety had entirely disappeared, it would have to be done, and he gave figures to show that this would be profitable work.

THURSDAY AFTERNOON.

This paper gave rise to a discussion which lasted over into the afternoon session, and which was at times of the most spirited character. Among those who discussed the possibilities of reforestation on a commercial basis in Canada were Mr. S. L. Peters, Queenstown, N.B.; Mr. Whitman, Mr. Snowball, Mr. Knechtel, Mr. Williams and Mr. Thos. A. Peters, of Hampton, N.B. The chief discussion was upon the sowing of tree seeds instead of planting, and much information was brought out.

FORESTRY AND GAME PROTECTION.

The first paper of the afternoon was that of Mr. E. T. Carbonnel, Secretary of the Fish and Game Protective Association of Prince Edward Island, on "The Relation of Forestry to Game Protection." This paper, in the absence of the author, was read by Mr. A. B. Warburton, M.P., of Charlottetown. Mr. Carbonnel dwelt upon the commercial and health-giving value of game reserves. In Prince Edward Island the desire to get more farm land had denuded the

valleys down to the banks of the streams, with the result that the streams had largely disappeared, the fish and game had gone and the farmer had not obtained one additional foot of arable land. He advocated the retention by the Crown in all future grants of a strip fifty feet wide on each side of streams.

TAR AND TURPENTINE.

Mr. Joseph Feinbrook, of Chatham, N.B., sent a paper on "The Manufacture of Tar and Turpentine in New Brunswick." This was read by Hon. W. C. H. Grimmer, who stated that Mr. Feinbrook had begun the manufacture of these products at Chatham, on lines followed in Russia. Mr. Feinbrook referred to the growing demand for these products. He believed that production would be driven to use the stumps and tops of white pine and black spruce, of which New Brunswick was full. The by-products were pine-pitch, pine-tar, creosote, wood alcohol and charcoal. Mr. Feinbrook also gave a description of forest methods in Russia, with which country he was familiar.

CONDITIONS IN NEW BRUNSWICK.

Mr. W. H. Berry, Superintendent of Scalers for New Brunswick, read a paper on "Conditions in New Brunswick." In reviewing the lumbering situation he said that in some localities the black spruce could be cut over every fifteen years. The regulation allowing the cutting of small sized timber in "thicket growth" was discussed and he said the Government was about to investigate the results of such thinnings. As to fire protection he advocated the prohibition of the burning of settlers' fallows, except upon obtaining permission from the district fire warden. He commended the establishment of a fire patrol by the Provincial Government, but held it should be supplemented by look-out stations on the hills. He stated that the Government of New Brunswick was about to

get an estimate of the standing timber, heath land, burnt land and waste land of all descriptions in the province.

These papers were also fully discussed by Mr. Robt. Connelly, Mr. Snowball, Mr. D. J. Buckley and others.

CONCLUSION.

The Resolutions Committee reported through Mr. Snowball. The non-contentious resolutions were first carried. These comprised the votes of thanks to His Honor Lieut.-Governor Tweedie, the Government of New Brunswick, the City of Fredericton for various kindnesses, including the free use of the Opera House, the Press, the Railways, the speakers from a distance, the Chairman and others, and the resolutions which were afterwards confirmed by the annual meeting and which will be found in the report of that gathering on another page.

The resolution regarding pulpwood was, after considerable discussion, passed in the following form:—

"That in the opinion of this Canadian Forestry Convention the time has arrived when, in the interest of the conservation of our forests, the federal and provincial governments should limit the cutting of lumber and pulpwood on Crown Lands."

There were then replies to the votes of thanks by His Honor Lieut.-Governor Tweedie, Hon. W. C. H. Grimmer, Hon. Senator Edwards, Hon. Charles E. Oak, Mr. Irvin C. Williams and Mr. W. R. Brown.

The convention closed with cheers for the King.

In the evening Mr. Abraham Knechtel, Inspector of Dominion Forest Reserves, delivered an illustrated lecture before an enthusiastic audience in the Opera House on "An Evening in the Forest." The building, which seats 850 people, was crowded, and two hundred were turned away unable to gain admittance.

THOSE PRESENT.

Dr. W. W. Andrews, Mount Allison University, Sackville, N.B.; W. L. Allain, M.P.P., Riviere des Caches, N.B.; William Anderson, Burnt Church, N.B.; John B. Alexander, Fredericton, N.B.; C. A. Alexander, Campbellton, N.B.; Henry A. Allen, Waterloo, Que.; W. E. Armstrong, Waweig, N.B.

Hon. J. P. Burchill, Nelson, N.B.; A. F. Bentley, M.P.P., St. John, N.B.; Avila Bédard, M.F., Dept. of Lands and Forests, Quebec City, P.Q.; W. R. Brown, Secretary Forest Commission of New Hampshire, Berlin, N.H.; Prof. L. W. Bailey, LL.D., Fredericton, N.B.; James P. Byrne, M.P.P., Bathurst, N.B.; H. V. B. Bridges, Principal Provincial Normal School, Fredericton, N.B.; Rev. T. Hunter Boyd, Waweig, N.B.; Judge J. H. Barry, Fredericton, N.B.; Lt.-Col. J. W. Bridges, Fredericton, N.B.; R. S. Barker, Crown Lands Dept., Fredericton, N.B.; R. R. Bradley, Forester Miramichi Lumber Co., Boiestown, N.B.; W. H. Berry, Provincial Superintendent of Scales, Oak Bay, N.B.; O. P. Boggs, Moncton, N.B.; F. B. Black, Sackville, N.B.; Peter Z. Barrian and D. J. Buckley, Rogersville, N.B.; W. H. Baldwin, Chatham, N.B.; John Betts, Millerton, N.B.; Arthur A. Brown, Chatham, N.B.; J. P. Burchill, Jr., University of New Brunswick, Fredericton, N.B.

C. Fred. Chestnut, Mayor of Fredericton; W. S. Carter, Chief Superintendent of Education, Fredericton, N.B.; M. Cumming, Secretary for Agriculture for Nova Scotia, Truro, N.S.; Charles L. Cyr, M.P.P., St. Leonards, N.B.; A. B. Copp, M.P.P., Sackville, N.B.; Wm. Currie, M.P.P., Campbellton, N.B.; Duncan Cameron, Inspector, Royal Bank of Canada, Montreal, Que.; Rev. Father F. L. Carney, Fredericton, N.B.; Lt.-Col. H. Montgomery Campbell, Apohaqui, N.B.; Thos. H. Colter, Fredericton, N.B.; T. R. Campbell, Salisbury, N.B.; Arthur Culligan, Jacquet River, N.B.; C. W. Connell, Woodstock, N.B.; Christopher Crocker, Millerton, N.B.; Robt. Connelly, Great Salmon River, N.B.; W. L. Carr, Woodstock, N.B.; Frank Curran, and A. B. Carson, Rexton, N.B.; Standish S. Converse, Sayabec, Que.; P. Chiasson, Rogersville, N.B.

W. B. Dickson, M.P.P., Hillsboro, N.B.; Alfred Dickie and Rufus E. Dickie, Stewiacke, N.S.; Frank Day, Fredericton, N.B.; George Y. Dibblee, Fredericton, N.B.

Hon. Senator W. C. Edwards, Ottawa, Chairman Forestry Committee, Commission of Conservation; James A. Estey, St. John, N.B.; C. M. Edwards, Ottawa, Ont.

Hon. J. K. Fleming, Provincial Secretary, Woodstock, N.B.; Donald Fraser, sr., Fredericton, N.B.; Samuel Freeze, Doaktown, N.B.

Hon. W. C. H. Grimmer, Surveyor-General of New Brunswick, St. Stephen, N.B.;

John B. Gregory, York and Sunbury Mills, Fredericton, N.B.; Hon. G. F. Hill, St. Stephen, N.B.; Parker Glazier, M.P.P., Fredericton, N.B.; H. J. P. Good, Manager Dominion Exhibition, St. John, N.B.; Henry Gilbert, Rothesay, N.B.; E. S. Gillmore, Fredericton, N.B.; Denis C. A. Galarneau, M.F., Forester, Louison Lumber Co., Jacquet River, N.B.; W. J. Glen, Fredericton, N.B.; G. D. Grimmer, St. Andrews, N.B.; G. Skiff Grimmer, University of New Brunswick, Fredericton, N.B.; George Green, Lakeville, N.B.

Hon. J. D. Hazen, K.C., Premier of New Brunswick, St. John, N.B.; Dr. G. U. Hay, St. John, N.B.; W. C. J. Hall, Superintendent Bureau of Forestry, Quebec City, Que.; W. Frank Hatheway, M.P.P., St. John, N.B.; T. A. Hartt, M.P.P., St. Andrews, N.B.; A. H. Hilyard, Dalhousie, N.B.; W. W. Hubbard, Dept. of Agriculture, Fredericton, N.B.; Prof. Ernest Haycock, Acadia University, Wolfville, N.S.; A. E. Hanson, Deputy Land Surveyor, Fredericton, N.B.; N. Balfour Hill, Nashwaaksis, N.B.; Carl G. Hansen, Salmonhurst, N.B.; George Hazen, jr., Fredericton, N.B.; J. A. L. Henderson, Moncton, N.B.; J. Norman Hallett, Fredericton, N.B.

J. D. Irving, Buctouche, N.B.

Dr. Cecil C. Jones, Chancellor of the University of New Brunswick, Fredericton, N.B.; George B. Jones, M.P.P., Apohaqui, N.B.; John Jamison, Clover Hill, N.B.; W. H. Jackson, Fredericton, N.B.; A. H. Jewett, Fredericton, N.B.; Wm. Jaffray, St. Mary's Ferry, N.B.; Thomas Johnstone, Red Bank, N.B.

T. B. Kidner, Supt. of Manual Training, Normal School, Fredericton, N.B.; Abraham Knechtel, Inspector of Dominion Forest Reserves, Ottawa, Ont.; Benjamin Kilburn, Kilburn P. O., N.B.; H. C. Kinghorn, University of New Brunswick, Fredericton, N.B.

Hon. David V. Landry, M.D., Commissioner for Agriculture, New Brunswick, Buctouche, N.B.; Hon. C. H. La Billois, M.P.P., Dalhousie, N.B.; Lt.-Col. T. G. Loggie, Deputy-Surveyor-General, Fredericton, N.B.; C. M. Leger, M.P.P., Memramcook, N.B.; Frank H. Low, Aylesford, N.S.; C. E. Lund, Sackville, N.B.; John S. Leighton, jr., and M. Lodge, Moncton, N.B.

Hon. H. F. McLeod, Solicitor-General of New Brunswick, Fredericton, N.B.; D. P. MacLachlan, M.P.P., Chatham, N.B.; Lt.-Col. J. B. T. Mackenzie, Chatham, N.B.; Wm. McIntosh, Curator Natural History Museum, St. John, N.B.; T. N. McGrath, Tusket, N.S.; Reid McManus, Memramcook, N.B.; W. C. McManus, Halifax, N.S.; Charles R. Macleay, Sayabec, Que.; Rev. Father H. McRory, Chatham, N.B.; Allan P. McAuley, Pioneer, N.B.; Thos. McMullen, Blaney Ridge, N.B.; W. A. McMullen, Crown Lands Dept., Frederic-

ton, N.B.; John McCohn, North East Boom, N.B.

Hon. John Morrissy, Chief Commissioner of Public Works for New Brunswick, Fredericton, N.B.; Donald Munro, M.P.P., Woodstock, N.B.; G. F. Matthew, LL.D., St. John, N.B.; James M. Macoun, Geological Survey, Ottawa, Ont.; R. B. Miller, Professor of Forestry, University of New Brunswick, Fredericton, N.B.; H. Morton Merriman, Campobello, N.B.; G. G. Murdoch, D.L.S., St. John, N.B.; John A. Morrison, Phoenix Lumber Mills, Fredericton, N.B.; Wm. Murray, Campbellton, N.B.; W. S. Montgomery, Dalhousie, N.B.; P. G. Mahoney, Melrose, N.B.; Howard G. Murchie, St. Stephen, N.B.; Warren Malone and James Malone, Stanley, N.B.; John Murphy, Ludlow, N.B.

R. Neal, Greenville, N.B.; Joseph Norrad, Boiestown, N.B.

Hon. Chas. E. Oak, Bangor, Maine, and Chatham, N.B.; John O'Brien and J. Mac O'Brien, Nelson, N.B.; R. O'Leary, Richibucto, N.B.

Wm. Power, Quebec City, P.Q.; Hon. B. F. Pearson, Halifax, N.S.; Wm. Pearce, Canadian Pacific Railway Irrigation Dept., Calgary, Alta.; G. C. Piche, M.F., Chief Forest Engineer, Dept. of Lands and Forests, Quebec, P.Q.; Geo. D. Prescott, M.P.P., Albert, N.B.; W. Gerard Power, St. Pacome, Que.; James K. Pinder, M.P.P., Pokiok, N.B.; C. Pickard, Sackville, N.B.; Saunders Price, Doaktown, N.B.; Gilbert H. Prince, Fredericton, N.B.; Thos. A. Peters, Hampton, N.B.; Geo. A. Perley, Warden of Sunbury County, N.B.; J. D. Phinney, LL.D., Fredericton, N.B.; Horace A. Porter, Secretary Canadian Club, St. John, N.B.; S. L. Peters, Queenstown, N.B.; Paul E. Porter and James E. Porter, Andover, N.B.

Hon. C. W. Robinson, M.P.P., Moncton,

N.B.; Thos. Robison, M.P.P.; Harvey Station, N.B.; James Robinson, Millerton, N.B.; S. S. Ryan, Moncton, N.B.; John T. Rundle, Chatham, N.B.

Hon. Clifford Sifton, Chairman Commission of Conservation, Ottawa, Ont.; W. B. Snowball, Chatham, N.B.; Hon. F. J. Sweeney, M.P.P., Moncton, N.B.; A. R. Slipp, M.P.P., Fredericton, N.B.; Dr. A. Sormany, M.P.P., Shippegan, N.B.; John Sheridan, M.P.P., Buctouche, N.B.; A. F. Struthers, Bridgewater, N.S.; Robt. LeB. Stevens, St. John, N.B.; F. W. Sumner, Moncton, N.B.; R. P. Steeves, Sussex, N.B.; A. A. Sterling, Sheriff, Fredericton, N.B.; A. M. Sterling, Fredericton, N.B.; E. A. Stone, University of New Brunswick, Fredericton, N.B.; J. E. Stewart, Dalhousie, N.B.; Frank D. Seely, Round Hill, N.B.; G. E. Stoddard, Pioneer, N.B.; Wm. M. Sinclair, Newcastle, N.B.

His Honor L. J. Tweedie, Lieutenant-Governor of New Brunswick.

George W. Upham, Woodstock, N.B.

R. B. Van Dine, Fredericton, N.B.

Hon. A. B. Warburton, M.P., Charlottetown, P.E.I.; F. C. Whitman, President Lumbermen's Association of Western Nova Scotia, Annapolis Royal, N.S.; Irvin C. Williams, Deputy Commissioner of Forestry for Pennsylvania, Harrisburg, Pa.; Ellwood Wilson, Forester, Laurentide Paper Co., Grand Mere, Que.; H. W. Woods, M.P.P., Welsford, N.B.; F. Page Wilson, Editor Pulp and Paper Magazine of Canada, Toronto; F. E. Winslow, Fredericton, N.B.; C. Archie Williams, Fredericton, N.B.; J. A. W. Waring, C.P.R., St. John, N.B.; R. B. Wallace, Fredericton, N.B.; W. Williams, Opnabog, N.B.

John A. Young, Taymouth, N.B.

E. J. Zavitz, Professor of Forestry, Ontario Agricultural College, Guelph, Ont.

CONSTITUTION AND BY-LAWS OF THE CANADIAN FORESTRY ASSOCIATION.

I. NAME.

The name of the Association shall be:
THE CANADIAN FORESTRY ASSOCIATION.

II. OBJECT.

Its objects shall be:—

(1) To advocate and encourage judicious methods in dealing with our forests and woodlands.

(2) To awaken public interest to the sad results attending the wholesale destruction of forests (as shown by the experience of older countries) in the deterioration of the climate, diminution of fertility, drying up of rivers and streams, etc., etc.

(3) To consider and recommend the ex-

ploration, as far as practicable, of our public domain and its division into agricultural, timber and mineral lands, with a view of directing immigration and the pursuits of our pioneers into channels best suited to advance their interests and the public welfare. With this accomplished, a portion of the unappropriated lands of the country could be permanently reserved for the growth of timber.

(4) To encourage afforestation wherever advisable, and to promote forest tree-planting, especially in the treeless areas of our north-western prairies, upon farm lands where the proportion of woodland is too low, and upon highways and in the parks of our villages, towns and cities.

(5) To collect and disseminate, for the benefit of the public, reports and information bearing on the forestry problem in general, and especially with respect both to the wooded and prairie districts of Canada, and to teach the rising generation the value of the forest with a view of enlisting their efforts in its preservation.

(6) To secure such forestry legislation from time to time from the federal and provincial governments as the general interests demand, and the particular needs of the people seem to require.

III. MEMBERSHIP.

Its membership shall include all who pay an annual fee of \$1.00 or a life membership fee of \$10.00.

IV. OFFICERS.

The officers shall comprise an honorary President, a President, a Vice-President, a Secretary, an Assistant Secretary, a Treasurer, the editor of the official organ of the Association and twenty-one directors, and from (and including) the Association year 1909-10 the ex-presidents of the Association shall be members of the Board of Directors.

V. ELECTIONS.

These officers shall be elected by ballot at the annual meeting of the Association, and shall serve one year, or until their successors are elected. Vacancies occurring during the year may be filled by the Executive Committee.

VI. EXECUTIVE COMMITTEE.

The officers shall constitute an Executive Committee, and five of the same shall be a quorum, and they will appoint a Vice-President for each province and as far as possible for each provisional district of the Dominion.

VII. ANNUAL MEETING.

The annual meeting of the Association shall be held during the month of February in the City of Ottawa, upon such a date as shall be decided by the Executive Committee of the Association, a notice of one month of which shall be given to each member by the Secretary.

VIII. SPECIAL MEETINGS.

Special meetings shall be held at such times and places as the Executive may decide, a sufficient notice of which shall be sent to each member by the Secretary.

IX. AMENDMENTS.

Amendments of the Constitution can only be adopted by a two-thirds vote of the members present and entitled to vote, and at the annual meeting of the Association,

and a notice of such intended amendment shall be given with the notice calling the meeting.

BY-LAWS.

PRESIDENT.

The President shall preside at all meetings of the Association.

VICE-PRESIDENT.

In the absence of the President a Vice-President shall preside at all meetings of the Association; and in the absence of all of them a President pro tempore shall be elected by the meeting.

SECRETARY AND ASSISTANT SECRETARY.

The Secretary shall keep a record of the proceedings of the Association and of the Executive Committee and shall be custodian of all documents, books and collections ordered to be preserved.

He shall conduct the correspondence of the Association and shall keep a list of members with their residences and shall notify members of the time and place of meeting of the Association, and in his absence his duties will be discharged by the Assistant Secretary.

TREASURER.

The Treasurer shall have the custody of all moneys received, and shall deposit or invest the same in such manner as the Executive Committee shall direct, and shall not expend money except under direction or approval of the Executive Committee. The financial year of the Association shall close on December 31st of each year.

ORDER OF BUSINESS.

At the regular meeting of the Association the order of business shall be that proposed by the Executive Committee and announced by the Presiding Officer. In the absence of such prepared order of business, the following shall be observed:—

- (1) Calling to order.
- (2) Reading of minutes.
- (3) Reading and referring or disposing of letters, accounts, etc.
- (4) Reports of Committees.
- (5) Inquiries and notices of motion.
- (6) President's address.
- (7) Papers, addresses and discussion by members and others invited by the meeting.
- (8) Nomination and election of officers.
- (9) Unfinished and miscellaneous business.
- (10) Adjournment.

FIRST MEETING OF THE COMMISSION OF CONSERVATION.

The first annual meeting of the Commission of Conservation, which was held in Ottawa on January 18th to 21st last, marks a national movement for the conservation of this country's natural resources and is of particular interest to all those interested in the forest problems of

Tuesday, January 18th, the inaugural address was delivered by the Hon. Clifford Sifton, Chairman of the Commission. It was a most comprehensive review of Canadian conditions and a masterly statement of the problems that lay before the Commission. In his preliminary remarks Mr. Sifton



Hon Clifford Sifton, Chairman of the Canadian Conservation Commission.

Canada. The feature of note in connection with the Commission is its representative nature. Lumbermen, engineers, university professors, financiers, political leaders and others—all found themselves uniting harmoniously for the advancement of a single patriotic cause.

HON. MR. SIFTON'S ADDRESS.

On the morning of the first day,

referred to the fact that the Commission had been unanimously constituted by Parliament and showed how, in the choice of members, every precaution had been taken to preclude provincial or sectional jealousy. The Commission earnestly desired to cooperate with all the provincial governments and with every organization that had for its object the conservation of natural resources. So im-

portant did he consider this feature that he had determined to dissociate himself from politics and devote his time entirely to the work of conservation, believing that the heartiest co-operation of all the members of the Commission could be thereby secured.

The problem of conservation was not so difficult in Canada as in the United States. For instance, the United States had pursued the policy of selling their timber lands outright, thus removing them from government regulation. This, coupled with an uneconomic method of forest taxation, had resulted in the rapid disappearance of the forests.

In Canada, however, the amount of timber land privately owned was comparatively trifling, and Canadian timber cutting regulations provided for the most absolute governmental control. In addition, large areas of land around the head waters of streams were owned by the Dominion Government and could at any time be turned into forest reserves.

After tracing the history and growth of the conservation movement in the United States as well as in Canada, Mr. Sifton proceeded to treat of the conservation of the various national resources of the country. Canada's mineral output was increasing by leaps and bounds, as was shown by the exportation of \$87,000,000 worth of mineral products in 1908, as compared with \$20,500,000 worth in 1905. Yet only the fringe of our vast mineral producing areas had been touched. A great work was to be done in instituting more economical methods of mining, especially in coal mines; while smelting processes should be improved so as to save much of the valuable mineral contents of ores which are now largely wasted. Moreover, Canada, being a young mining country, had a large number of mining accidents. The large number of fatalities was due to the carelessness of prospectors and others engaged in mining who had had little or no previous experience in work of that class.

Fisheries and public health were next dealt with. The fisheries constituted one of Canada's most valuable resources. The federal and provincial governments had departments devoted to fisheries and the Commission should give these every support in their work. The public health, in view of its fundamental relation to national efficiency, had received all too little attention from the Government. While hundreds of thousands of dollars were spent yearly in eradicating the diseases of animals, no similar effort was being made to meet the ravages of disease among human beings. The Commission, representing as it did both the federal and the provincial governments, could render invaluable aid in the fight against disease, especially against tuberculosis.

Following this, Mr. Sifton proceeded to deal with the sources and uses of the water supply. It was to be seriously questioned, he said, if the time had not arrived when all power development should be under the control of the governments concerned and subject to governmental control in the public interest. Canada with her wonderful wealth in water-powers was nevertheless behind other nations in her water-power law. Ontario, however, with its Hydro-Electric Power Commission, was keeping abreast of the most advanced thought in this line.

In forestry, Mr. Sifton stated, there had been great progress in the last few years. The growth of the Forestry Branch of the Department of the Interior and the founding of faculties of forestry in Canadian universities substantiated this. Thanks to the efforts of the Canadian Forestry Association, an enlightened public opinion had clearly grasped the necessity for the conservation of our forests and could be relied upon to support all well-considered measures having that end in view.

While the policy adopted by the Dominion Government made the timber lands leased to private indi-

viduals subject to the fullest regulation, there were, nevertheless, some generally admitted evils in the present methods of lumbering. These were (a) destruction of young growths; (b) cutting of trees not sufficiently matured, and (c) leaving inflammable refuse and debris upon the ground. The adoption of regulations for cutting, calculated to conserve and improve the merchantable timber, was important. This subject, however, was receiving more or less attention from the various authorities.

The greatest enemy of the forest was fire, and relentless war should be waged against the present destruction of forests by it. Notwithstanding all that had been said and done the destruction was widespread and constant. No measures could be regarded as too radical and no efforts too laborious to put a stop to it. It must be stopped at any cost. Fertility of soil, regularity and volume of stream flow, climatic moderation, as well as timber supply, depended upon the prevention of fire losses.

Great praise, he said, was due to the governments of Ontario and Quebec for taking up the question of protection of forests vigorously. The Ontario fire-ranging system was excellent and the Quebec system of large reserves to be systematically studied was also a progressive step. The main point to be considered in connection with both, however, was that the fire-ranging system did not sufficiently cover the forest land which has no merchantable timber upon it at present.

Two great reserves, Mr. Sifton considered, could be immediately created with substantial advantage. The first of these should embrace all the forest land on the eastern slope of the Rocky Mountains. The Dominion Government was about to bring in a bill for the purpose of making this reserve. The second should include all the provincial government land south of the Height-of-Land, extending from Sudbury to the neighborhood of Port Arthur, except such portions along

the railway as are fit for cultivation.

Apart from minerals the latter territory, he said, was fit for almost nothing except growing timber. The timber and the soil covering the rocks were rapidly being destroyed by fire, but could be preserved at small expense if the railway fires were stopped. The effectiveness of even partial protection was being demonstrated in Algonquin Park, where the government of Ontario had perhaps the greatest opportunity for practical forestry possessed by any government in the world.

There had been a considerable amount of attention given to the prevention of fires along the Transcontinental Railway, but the subject was one of great importance and the work should be systematically reviewed in order to make it certain that there was nothing neglected and that we should not have the same disastrous destruction of timber along the new road as had taken place in other similar cases. The really dangerous period would come when trains began to run on the line.

At the conclusion of Mr. Sifton's address, His Excellency Earl Grey expressed his unqualified approval of the Conservation movement and promised every assistance in his power to make the work of the Commission a success.

DR. FERNOW ON FORESTRY.

Dr. Fernow, Dean of the Faculty of Forestry, Toronto University, contributed an able paper on "Scientific Forestry in Europe: its Value and Applicability in Canada," in which he explained what other countries had done in the development of forestry policies, and showed what features in their experience could be profitably adapted to Canadian conditions.

Devoting his attention first to the question "Does Forestry Pay?" he related what several European countries had achieved in making forestry a profitable venture. Prussia, in 1830, a short time after the adoption of a scientific forestry policy, had pro-

duced twenty-nine cubic feet per acre per year of timber, while in 1907, when the results of the forest policy began to be fully realized, the annual production per acre was 61 cubic feet. In 1907, the gross revenue of 72 cents per acre and the net revenue of 44 cents had increased to \$4.55 and \$2.52 per acre respectively.

annually an income at least seven times the net income of Ontario from an acreage which is about half the area now under license in that province. And all this income was, so to speak, merely the interest on an investment; the capital itself, i.e., the forest, was unimpaired. A part of this increase in value was due, it is



Stand of White Pine on Sandy Land unfit for Agriculture.

The experience of Saxony had been of a similar kind. In the period from 1817 to 1826 her gross revenue from forests had been \$1.57 per acre per year and her net revenue 62 cents. In 1905 they were \$8 and \$3 respectively. Prussia, he declared, derived

true, to increase of stumpage values but the enhancement was mainly due to business-like and scientific methods of management.

France in the past sixty years had reclaimed by tree planting 2,300,000 acres of what was previously con-

sidered absolutely waste and worthless land. This had cost \$15,000,000, but the reforested area was now estimated as being worth \$135,000,000, and produced an annual crop valued at \$10,000,000.

The first essential to the inauguration of a profitable scientific forestry policy was that people should consider the forest as a field capable of producing annual crops, not as a mine which is to be worked to exhaustion. This forest crop, however, took a long time to mature and the self-interest of the individual was not far-seeing enough to wait for the returns. It was, therefore, necessary that the state or some other persistent corporation should assume the ownership and management of forest lands.

After rapidly sketching the history of forestry and showing that it was a comparatively recent science, Dr. Fernow next considered the world's supply of timber and the rate of consumption. While the wooded area of the world might be figured at over four billion acres, the really productive forest area capable of furnishing the kind of timber which plays a role in the markets of the world is probably not over half that figure. The annual consumption of wood was tolerably closely known to be in the neighbourhood of forty billion cubic feet. Taking 40 cubic feet per acre as a fair average production, it would appear that there is a large enough area available to furnish all supplies, provided it were managed for such production.

How then should we manage our forests? Four methods had been tried for securing an economic handling of forest properties for reproduction:—

1. Government ownership and management, based on the *paternal* function of government.
2. Municipal ownership and government supervision of its management, by exercise of the *fiscal* function of the state.
3. Restriction of private forest

management, by exercise of the *police* function of the state.

4. Encouragement of private forest management, by exercise of the *educational* function.

The tendency in Europe, said Dr. Fernow, was toward state ownership and control. Prussia in 1902 had set aside \$30,000,000 for the purchase of waste lands and annually spends nearly half a million dollars in reforestation of these. The long waiting for the first crop from forests was a very strong argument in favor of state ownership.

In France municipal ownership and control under state guidance was much in vogue. There, too, the supervision of private forest management is much more developed than in Germany and is much more strict. Restrictive measures on private property, however, had everywhere been found difficult to enforce and were in large measure being supplanted by the greater freedom of management vested in administrative officers.

For direct application to Canadian conditions the German system was perhaps too ideal. In Sweden, however, conditions were to be found similar to those prevailing in Canada. Forest fires and the axe, as with us, had devastated large areas, while like methods of disposing of timber lands had been followed. The Swedes, after many disappointing experiments, had adopted their present system in 1905.

This system places the control of all private forests in the hands of Forest Conservation Boards. These Boards, one for each province, have surveillance of all private forests and can enforce their rulings by court proceedings. An export duty on timber and dry wood-pulp is imposed to furnish funds for carrying out the law. The management of municipal forests is placed under the state administration, the corporation paying for such service. Dr. Fernow advised that the character and actual workings of these attempts in Sweden be

submitted to a closer inspection by the Commission.

The greatest need, said Dr. Fernow, was a radical change in the attitude of people and governments and a thorough realization that the existing methods of treating timber lands are bad. After this has been accomplished the next thing to do is to acquire more knowledge regarding our forest resources. Present knowledge regarding these was largely guesswork. A more authoritative collation of known facts should be made and a cheap preliminary forest survey, such as he had made in Nova Scotia at a cost of less than 25 cents per square mile, should be made.

The experience of other nations that state ownership has invariably furnished better results, either with or without state control, should make us adhere to state ownership as a principle. If this were agreed to, it could be very easily adapted to present conditions because the Dominion or the provinces owned the bulk of our forest property. The next step would be the installation of properly manned forestry bureaus in each province to manage this property in accordance with scientific principles. "Perhaps, however," continued Dr. Fernow, "before such bureaus are established it might be advisable to appoint Royal Commissions for each province, or possibly committees of this commission similar to the Swedish Conservation Boards, to formulate plans of procedure which would remove the reform from the political arena." This would permit of an equitable adjustment of the claims of licensees who would have to be compensated for the cancellation of their licenses. Provincial control would also allow each province to adjust its laws to its own peculiar conditions. Yet even provincial legislation should be as little specific as possible, leaving the drafting of specific rules to the administration.

Dr. J. W. Robertson in an address on "The Conservation of Agricul-

tural Resources" dwelt upon the valuable heritage Canadians had in their agricultural lands and emphasized the fundamental importance of agriculture in the national economy. The fertility of the soil should be conserved by the use of fertilizers and the employment of judicious crop rotations. In this respect Canada had much to learn from European practice. He said that more careful attention should be paid to the selection of clean seed and showed how necessary it was to make the farm environment sanitary and attractive.

TUESDAY AFTERNOON'S SESSION.

In a paper on "Possible Economies in the Production of Minerals of Canada," Dr. Eugene Haanel, Director of the Mines Branch of the Department of Mines, pointed out what economies could be effected by the adoption of less wasteful methods of mining and smelting. He deprecated the practice of sending Canadian ores to foreign countries to be treated. The number of fatalities in mine accidents was too large and means should be taken to protect miners, especially with regard to the handling of explosives.

Hon. Adam Beck, Chairman of the Ontario Hydro-Electric Power Commission gave an admirable paper on "Hydro-Electric Developments in Ontario, Developed and Potential." Mr. Beck traced the history of the hydro-electric movement in Ontario and gave a detailed description of the works constructed and in process of construction. The industrial advantages that Niagara power gave to Western Ontario and the savings effected in the cost of power were clearly outlined, while the fact was demonstrated that none of the rights or property of vested interests had been usurped. The address was a very clear and comprehensive, yet compact, account of the whole hydro-electric project.

"Fish and Game in Ontario" was the subject discussed by Mr. Kelly Evans, of the Ontario Fish and Game Commission. He laid stress on the economic value of our fisheries and, by statistics, showed how the stock of fish, especially whitefish, was being depleted. The experience of Maine and Ontario showed how valuable were game fisheries. They very often brought into the country people who not only spent a good deal of money in Canada, but very often were induced to invest capital in Canadian enterprises. He advocated the levying of a tax on anglers such as Ontario had. This would aid materially in tracing home many forest fires to the guilty parties.

WEDNESDAY EVENING.

At Wednesday evening's session Mr. F. T. Congdon, M.P., of Dawson, Y.T., spoke on the preservation of fur-bearing animals in Canada. Poison and wolves, he declared, were the chief foes of wild game. More stringent laws should be passed against the use of poison, and the bounty on wolves should be increased. A considerable number of small game preserves, each devoted to the perpetuation of a particular species, should be formed to prevent the extinction of fur-bearing animals.

At the same session, Dr. P.H. Bryce, Chief Medical Inspector of the Department of the Interior, gave an address on "Measures for the Maintenance and Improvement of the Public Health," in which he devoted special attention to the milk supply and infant mortality, tuberculosis, typhoid fever and municipal water supply.

Dr. H. T. Gussow, Botanist at the Central Experimental Farm, gave a most instructive illustrated address on "Diseases of Forest Trees." In Canada the public, he said, had regarded this subject as of too little importance, considering the magnitude of the losses caused by diseases of trees. He referred to the serious inroads of the "Damping-off fungus" upon young seedling conifers, and stated that the ravages of this disease had led to the importation from foreign countries into Canada of seedlings two or more years of age. Unfortunately this practice brought serious results; for it was found that a large shipment of white pine seedlings from Europe in 1909 was infected with white pine rust, the disease not being discovered till the young trees had been planted. Dr. Gussow then proceeded to give a thorough description of the disease known as "Larch canker," which is affecting considerable areas of tamarack in Canada. He described the symptoms and progress of, and the remedies for, the more important fungus diseases and concluded with the statement that one of the most important steps the Commission could take was the institution of some method of inspection for forest reserves.

"Insects Destructive to Canadian Forests" was the subject of an illustrated address by Dr. C. Gordon Hewitt, Entomologist, Central Experimental Farm. Dr. Hewitt stated that the damage done to trees by insects was much greater than was supposed, the insects often co-operating with forest fires to destroy our timber resources. Since the forests of Canada were composed chiefly of coniferous trees, the speaker dealt mainly with insects preying upon these. At the present time, the Larch Sawfly, he stated, was the most widely spread forest insect in Canada, and was proving very destructive to the tamarack in Eastern Canada as far west as Winnipeg. Insect-eating birds should be

given every possible protection since they were an important means of keeping this insect under control. The Spruce Budworm had wrought havoc with the spruce in Eastern Canada and in Vancouver Island, while the Brown-tail Moth, which had been imported in foreign nursery stock, would prove very disastrous were it allowed to get into the fruit growing districts. To prevent its further introduction the Government was inspecting all imported nursery stock, but too great care could not be exercised in this regard.

COMMITTEES APPOINTED.

Mr. Chas. R. Coutlee, Engineer in charge of the Georgian Bay Canal Survey, on Thursday morning in an address on the "Water Wealth of Canada, with special reference to the Ottawa River Basin," gave an exhaustive and systematic survey of the water resources of Canada and predicted that the Ottawa valley would become the power heart of the continent.

The Commission then proceeded to organize committees to deal with the several branches of natural resources. The committees are as follows:—

COMMITTEES OF THE COMMISSION OF CONSERVATION.

Committee on Fisheries, Game and Fur-bearing Animals—

Hon. F. L. Haszard, Chairman; Hon. Hugh Armstrong, Hon. Frank Cochrane, Hon. Price Ellison, Hon. W. C. H. Grimmer, Hon. A. K. Maclean, Dr. Howard Murray.

Committee on Lands—

Dr. J. W. Robertson, Chairman; Dr. Geo. Bryce, Hon. Sydney Fisher, Hon. Benj. Rogers, Dr. W. J. Rutherford, and the ex-officio Members of the Commission who represent the various provinces.

Committee on Minerals—

Dr. H. S. Béland, Chairman; Mr. John Hendry, Dr. Howard Murray, Hon. W. Templeman, and the ex-officio Members of the Commission who represent the various provinces.

Committee on Press and Co-Operating Organizations—

Mr. J. F. Mackay, Chairman; Hon. Jules Allard, Hon. Geo. Bryce, Dr. Howard Murray, Dr. H. M. Tory.

Committee on Public Health—

Mr. E. B. Osler, Chairman; Dr. H. S. Béland, Hon. J. A. Calder, Hon. Sydney Fisher, Sir Sandford Fleming, Dr. Cecil C. Jones.

Committee on Waters and Water Powers—

Mr. F. D. Monk, Chairman; Hon. Jules Allard, Hon. Frank Cochrane, Hon. Price Ellison, Hon. W. C. H. Grimmer, Mr. C. A. McCool.

Committee on Forests—

Senator W. C. Edwards, Chairman; Mr. Frank Davison, Dr. B. E. Fernow, Mr. John Hendry, Mgr. J. C. K. Laflamme, Hon. Frank Oliver, Mr. W. B. Snowball, and the ex-officio Members of the Commission who represent the various provinces.

REPORTS OF COMMITTEES.

The Committee on Fisheries, Game and Fur-bearing Animals desired to postpone the submission of a report until further time was available for a more complete investigation than was then possible.

The Committee on Lands, in their report, proposed to collect information relative to occupied and unoccupied lands with respect to the character of soils, the crops best suited to each kind of soil and the decrease of soil fertility. The supply and availability of natural fertilizers will be investigated and information will be collected regarding water supply for domestic and irrigation purposes. The Committee also proposes to arrange for a series of meetings in each province for the purpose of disseminating information and arousing interest in the conservation of agricultural resources.

The Committee on Minerals reported that it deemed it advisable to obtain a compilation of statistics relative to the known mineral resources of Canada. It recommended that legislation be passed compelling mining companies to furnish the Government with statistics of their annual output and the estimated value thereof.

The Committee on Press and Co-Operating Organizations have the direction of the publicity work of the Commission and their policy is, therefore, of peculiar importance. Their report intimated that the results of the work of the other committees would be effectively placed before the public as they came to hand. Reports of the proceedings of the first annual meeting of the Commission will be issued to the extent of 12,500 copies. They recommended that periodical bulletins containing short pithy paragraphs on the work of the Commission be issued to the press and expressed their intention of holding public meetings in the various leading centres of the provinces to promote the work of Conservation.

The Public Health Committee will employ an expert to collect data respecting measures taken elsewhere to protect the public health as regards the pollution of streams by sewage and the contamination of water supply and to enquire into the most effective measures to prevent the spread of typhoid, tuberculosis and other contagious diseases.

The Committee on Waters and Water-Powers, in their report, declared their in-

tention of making a complete inventory of Canadian water-powers, developed and potential, together with an investigation of the rates charged for existing power. They would also co-operate with the Committee on Public Health in securing data regarding water supply and stream pollution. They placed themselves on record as being opposed to the granting of unconditional titles to water-powers and maintained that every water-power lease should be conditional on development within a specified time, that there should be public control of rates and that water-powers should be rented for a rental fee subject to revision.

REPORT OF THE COMMITTEE ON FORESTS.

The report of the Committee on Forests referred to the rapid destruction of Canadian forests by fire and by reckless cutting. In view of the approaching scarcity of timber and the close relation of wooded areas to water supply and regulation of stream flow, the Committee recommended that a progressive and scientific forestry campaign be entered upon.

Having regard to what other countries, notably France and Germany, had done in this line of work, they considered that our forests could be conserved and perpetuated and our denuded lands reforested, provided that every province co-operated heartily with the Dominion government.

"The three great requisites," says the report "are the prevention, in so far as such can be accomplished, of forest fires, systematic cutting on the part of lumbermen, under well devised and strictly enforced regulations, and reforestation of the burned-over areas unsuited for agricultural purposes.

"With the view of bringing about the much desired results, your Committee begs to suggest that the first steps to be taken are, to ascertain, as nearly as can be done, the quantity of each kind of standing timber in the various provinces and in the unorganized territory, a reasonable estimate of the annual growth of each, and the amount annually cut for domestic use and exportation; and, with the view of endeavoring to bring about uniformity of operation in so far as conditions will permit, to procure all available statutes and regulations governing the cutting of timber and the prevention of forest fires in the various provinces and territories; also to take the best means possible to ascertain the systems adopted in France, Germany and other countries for the preservation and perpetuation of their forests and for reforesting areas denuded of forest, in order that your Committee may be placed in the best possible position to recommend the most desirable means of conserving to Canada and its future use one of its most valuable assets."

After the report of the Committee on Forests was read a lengthy discussion followed. Rev. Dr. George Bryce noted that a matter of very great importance to the prairie province, viz., that of tree planting on lands that had never had trees upon them, was omitted from the report. Senator Edwards, however, assured him that this had been a mere oversight and that the matter would not escape the attention of the Committee.

Hon. Sydney Fisher considered that by far the most urgent question was to secure an inventory of our present forest wealth and thought it would be well to discuss that subject. Senator Edwards agreed with Hon. Mr. Fisher as to the importance of the subject, but said that, as the taking of an inventory involved the question of ways and means, the Committee thought it could best be settled by themselves at a later date when more time was at their disposal.

Mr. John Hendry, of Vancouver, said that British Columbia had a certain amount of information regarding her extensive forest resources and that a Royal Commission was at present investigating the subject. The Commission, he thought, could get a great deal of information from the provincial government.

As regards New Brunswick, Mr. W. B. Snowball said that that province had a fairly accurate knowledge of what timber there was on Crown Lands, but that it would be very much more difficult to secure information concerning the timber on the extensive areas there which were owned by railways and private individuals. He heartily favored the making of a cursory forest survey and thought it would be wise to recommend that the Dominion Government give some aid to the provinces for making such surveys.

The question of forest fires was a very live one and called forth a long and spirited discussion.

Mr. W. B. Snowball stated that the Intercolonial railway ran through some of the most valuable timber lands of New Brunswick, and that the Commission should take a strong position in favour of having that railway placed under the provincial laws respecting fire guardianship. The Commission of Conservation should see that the Intercolonial Railway Commission co-operated with the Crown Lands Department of the Province in assisting to watch fires and in clearing all inflammable material from the right of way.

Hon. W. C. H. Grimmer, Surveyor-General of New Brunswick, said that the suggestion for the electrification of the National Transcontinental Railway through Quebec and New Brunswick was one of the utmost importance to the preservation of the standing timber ad-

acent to the railway line. He commended the Dominion Government and the Commissioners of the National Transcontinental Railway for their efforts to prevent fires during the period of construction of the road by means of a fire ranging system. With a single exception all serious fires had been prevented.

"I do feel," said Mr. Grimmer, "that we in New Brunswick have a grievance so far as the Intercolonial railway is concerned." Hundreds and hundreds of miles of fire-devastated timber lands, he continued, were to be seen along its line. Last summer he had asked the Intercolonial Commission for free transportation for some of the chief fire-rangers, but was refused. The Intercolonial should be made to clear up its right of way, and sportsmen and anglers should have impressed upon their minds the danger of leaving camp-fires unextinguished.

Dr. B. E. Fernow thought that the matter of forest fires was one that could be taken in hand by the Commission without further planning. He suggested that the Committee on Forests be instructed to furnish an extensive report on the methods of fighting forest fires. He favored the organization of provincial committees to superintend the taking of an inventory of forest resources.

Mr. A. S. Goodeve, who is a member of the British Columbia Royal Commission on Forestry, stated that they had found little trouble in effectively guarding against fires set by sportsmen. Warnings printed on linen cloth had been posted up along all the trails, while settlers were not allowed to set out a fire in a timber district without first getting a permit from the fire warden. A very large proportion of fires, he said, was started by railways. The grades in the timber district of British Columbia were difficult, and the consequence was that the engine crews very frequently disregarded the rules laid down by the Railway Commission regarding the use of fire screens. The clearing of the right of way had been largely successful in British Columbia. Mr. Goodeve considered that the two most practical suggestions that had been made were those respecting the clearing of inflammable debris from the right of way and the holding of the railways directly responsible for fires set by them.

Hon. Mr. Sifton maintained that the destruction of forests by fire was a question affecting every province as well as the Dominion as a whole. "We ought to have," he said, "a distinct, clear and definite resolution on the subject which would authorize the Chairmen of the Committees, along with myself, to make the strongest representations on the subject to the Government. . . . I have never been able to work out the principle upon which we permit railways to go through the country

spreading destruction. We do not allow anyone else to do that, and why we should permit the railways to do so I cannot understand. For my part, I would be prepared to support the strongest possible resolution urging on the Government to make the laws such that the railways shall be primarily responsible. As to the Inter-colonial Railway, my own opinion is that it should be in the same position as any private corporation."

As the result of this discussion upon the subject the following resolutions relative to forest fires set by railways were passed by the Commission:—

"That it is important that steps be taken at once by this Commission to protect the forests from fire, especially along the line of railways; and

"That, in particular, legislation be recommended by this Commission to bring the Dominion Government railways under the Fire Laws of the several provinces through which they pass; and

"That government railways should also be made liable for damages done by fire originating from their engines; and

"That the burden of disproof should be on the railways; and also

"That the legislation provide for the transportation by all railways of the chief district fire rangers and fire wardens free of charge, when on their way to investigate or fight fires along their line of railway."

COMMISSION RE-ASSEMBLES IN JUNE.

The Commission will hold its next meeting during the second week in June at some place in the province of Quebec. The members departed from the initial meeting feeling that a good deal had been accomplished. Men interested in the same problems and engaged in the same kind of work from all parts of the country had been enabled to meet together and get acquainted with each other and with each other's work. Their work, it was felt, now had a principle of unity and co-ordination running through it. Ideas had been clarified, knowledge had been gained and additional confidence in themselves and in the success of their efforts had been acquired. Useful and practical legislation will undoubtedly follow as the result of the conclusions reached at this first meeting, while at it the foundation has been laid for more numerous and more extensive accomplishments at subsequent meetings.

BRITISH COLUMBIA TIMBER COMMISSION REPORTS.

The Royal Commission appointed by the government of British Columbia to investigate the timber and forestry questions of the province presented an interim report to the provincial legislature on January 25th last, recommending that timber licenses be renewable from year to year as long as merchantable timber remains on the property. After the preamble the report recalls the promise given at the preceding session of the legislature to deal with the question by amendments to the existing law, and goes on to recommend that "the proposed amendments be so framed as to provide that the special timber licenses, other than those provided for in sub-section 2 of section 57 of the Land Act, be renewable from year to year as long as there is on the land included in such license merchantable timber in sufficient quantity to make it commercially valuable (proof of which might be required by the chief commissioner), but that renewal shall be subject to the payment of such rental or license fee and such tax or royalty and to such terms, conditions, regulations and restrictions as may be fixed or imposed by any statute or order-in-council in force at the time renewal is made; that power should be provided or reserved for the chief commissioner or government where, after inspection, it is found that the land is fit for tillage and settlement and required for

that purpose that he or they may require the licensee to remove the timber from such land within a fixed time, at the end of which period the land shall be opened for settlement on such terms as the government may see fit." Legislation has been introduced in the legislature to give effect to the recommendations of the commission.

EXPORT OF PULP FROM N. B. The following resolution was unanimously passed by the Legislature of the Province of New Brunswick on

March 17th: "Resolved, that, in order that the advantages of our natural resources may to a greater extent be secured to people of our country and the public domain be preserved, all pulpwood and wood for pulp making purposes cut on Crown lands in New Brunswick should be manufactured within the province." The resolution is but a prelude to the enactment of legislation or other action leading to the prohibition of export of pulpwood from New Brunswick, so far as this lies within the jurisdiction of the provincial authorities.

The revenue of the Lands and Forests Department of the Quebec provincial government during the year 1909 was \$906,360.

THE NEW U.S. FORESTER.



Henry S. Graves, Forester of the United States.
(Director Yale Forest School 1900-Jan. 1910.)

Many of the readers of the CANADIAN FORESTRY JOURNAL have followed with interest the "Pinchot-Ballinger" controversy, one episode of which has been the resignation of Mr. Gifford Pinchot as Forester of the United States.

Mr. Pinchot had been Forester of the United States since 1898, when he succeeded Dr. Fernow on the latter's resignation to take charge of the New York State College of Forestry. The expansion of the Forest Service under his direction and the leading part he has taken in the Conservation movement are too well-known to require more than passing notice here.

Henry S. Graves, who has been ap-

pointed Mr. Pinchot's successor, has long been his close friend and associate in forestry work. The two friends collaborated in writing "The Adirondack Spruce." In 1898 Mr. Graves became Mr. Pinchot's assistant in the (then) Division of Forestry, but resigned in 1900 to take the directorship of the Yale Forest School, which, under his direction, had become the foremost school of forestry in America. This post he held until promoted to his present position. Ever alert, approachable, enthusiastic and endlessly energetic, the new forester will, it is safe to say, prove a vigorous and sagacious administrator of the great forest asset of the United States and a worthy successor of worthy predecessors in his high office. The JOURNAL congratulates him on the promotion and wishes him the highest success in his new sphere of work.



Gifford Pinchot, Chairman of the Conservation Commission of the United States; Forester of the United States, 1898-1910.

CANADIAN LUMBERMEN'S ASSOCIATION. The annual meeting of the Canadian Lumbermen's Association was held in Ottawa on February 1st last.

A number of important reports were presented and many questions of moment to the trade came up. In the evening the annual banquet of the Association was held at the Russell House. About sixty guests were present, and among the speakers were Hon. Clifford Sifton, Chair-

man of the Commission of Conservation, Mr. Thos. Southworth, President of the Canadian Forestry Association, and others. The officers of the Association for 1910-1911 are as follows: President, J. B. Miller, of Toronto; Vice-Presidents, J. C. Browne, of Ottawa, John Hendry, of Vancouver, B.C., D. C. Cameron, of Winnipeg, Man., and Alex. McLaurin, of Montreal, Que.; Secretary, Frank Hawkins, of Ottawa; Treasurer, R. G. Cameron, of Ottawa.

NOUVELLES TENDANCES ET MÉTHODES D'AMÉNAGEMENT

(TRAVAIL PRÉSENTÉ AU CONGRÈS INTERNATIONAL D'AGRICULTURE A VIENNE, EN 1907, SECTION DE LA SYLVICULTURE.)

Par M. de Gail, Conservateur des Eaux et Forêts à Epinal, France.

MÉTHODE DES AFFECTATIONS.

Pendant la dernière moitié du siècle dernier, la plupart des aménagements de futaie, la presque totalité en France, ont été établis en vue de l'application de la méthode dite "du Réensemencement naturel et des éclaircies."

A cet effet, la révolution était divisée en un certain nombre de périodes, généralement d'égale durée, fréquemment 4 ou 5. A chacune de ces périodes correspondait, sur le terrain, une affectation.

Pendant chacune des périodes, l'affectation correspondante devait être parcourue, et les autres devaient être parcourues par des coupes d'amélioration.

Le volume à prendre, chaque année, en coupe de régénération, formait la possibilité principale et était le quotient du volume existant dans l'affectation en tour, accroissement compris, par le nombre d'années formant la période.

Quant aux coupes d'amélioration, elles devaient être assises par contenance, à intervalles réguliers; le volume à réaliser à leur passage restait indéterminé.

Il importe d'ajouter que les affectations étaient généralement constituées d'un seul tenant, dût-on y comprendre des peuplements d'âges souvent disparates.

Ce système d'aménagement, encore employé fréquemment, présente un caractère attrayant, à raison de sa simplicité, mais il a aussi ses inconvénients, dont les principaux sont les suivants:

1° Diviser une forêt en quatre ou cinq affectations d'un seul tenant, cela est très-beau sur le plan; mais encore faut-il que les peuplements s'y prêtent, qu'ils ne soient pas d'âges trop différents, comme cela arrive souvent.

Est-il bien utile d'ailleurs d'avoir

ainsi cent ou deux cents hectares de peuplements du même âge, d'un seul tenant? On peut en douter; car s'il survient une catastrophe telle qu'un cyclone, une invasion d'insectes, toute une classe d'âge disparaît, et toute l'économie de l'aménagement est détruite.

2° Régénérer un quart par exemple de la forêt pendant le quart de la révolution, et ne faire que des coupes d'amélioration sur les trois autres quarts, cela va très-bien quand les peuplements s'y prêtent. Mais combien de fois arrive-t-il que l'affectation en tour renferme des bois trop jeunes, que l'on est obligé d'enlever tout de même, tandis que les autres affectations contiennent un grand nombre d'arbres mûrs, surannés, qu'il serait utile de réaliser, mais qu'on est amené à laisser sur pied tout de même? Dans les deux cas, on consent des sacrifices pour arriver à régulariser les peuplements.

3° On admet que les affectations sont constituées de telle manière que la possibilité des coupes principales à assier dans chacune d'elles, pendant la période correspondante, restera toujours sensiblement la même.

Peut-on en être certain? et en admettant que l'aménagiste ait pu assurer ce résultat par de savantes combinaisons, ces combinaisons ne peuvent-elles être détruites tout d'un coup par des réalisations forcées et imprévues, les dégâts d'un ouragan, le dépérissement prématuré etc.?

4° Il n'y a pas lieu sans doute de chercher à faire produire chaque année à une forêt un volume rigoureusement constant; mais encore est-il bon qu'il n'y ait pas de différences trop grandes dans le rendement, d'une année à une autre. Or il peut arriver qu'il se produise, surtout en montagne, des réalisations énormes de produits accidentels; si ces réalisations ont lieu

dans l'affectation, en tour de régénération, les coupes principales sont réduites d'autant et au besoin supprimées; si elles se produisent au contraire en dehors de cette affectation, elles viennent s'ajouter aux coupes prévues, sans que celles-ci soient réduites, et on arrive à exploiter alors tout d'un coup des volumes énormes, au préjudice de l'avenir.

PRECOMPTAGE.

Frappés des inconvénients qui viennent d'être exposés, certains aménagistes ont introduit, en 1878, un correctif à la méthode; ce correctif est le précomptage.

Précompter, c'est réduire la possibilité principale calculée d'après le volume existant dans l'affectation en tour de régénération, d'une quantité égale à une partie déterminée du volume réalisé dans les affectations hors tour.

Les auteurs de cette mesure admettaient bien que, dans les affectations hors tour, on pût réaliser des produits dits intermédiaires, sans que le rendement d'avenir en fût affecté, mais à condition que ces produits fussent réellement intermédiaires, c'est-à-dire, qu'ils fissent bien partie, par leurs dimensions, des peuplements que ces affectations devaient renfermer normalement; ils considéraient au contraire comme abusif d'enlever, sans compensation, des arbres dont la disparition pouvait occasionner un appauvrissement de l'affectation dans laquelle ils se trouvaient.

C'est ainsi que la dimension de l'arbre exploitable étant par exemple de 55 *cm* de diamètre, on a été conduit souvent à prescrire de précompter sur la possibilité le volume des arbres de 40 *cm* de diamètre et au-dessus, qui viendraient à être réalisés dans les affectations hors tour. Parfois, on précomptait à partir de 35 *cm* ou même de 30 *cm*. D'autres fois, on ne précomptait que les produits accidentels, et non ceux provenant des coupes d'amélioration.

Il y avait en réalité beaucoup d'arbitraire dans ces prescriptions.

En somme, le précomptage n'était qu'un palliatif, destiné à égaliser les produits d'une année à l'autre, et aussi à maintenir jusqu'à un certain point le rapport soutenu, au passage d'une période à la suivante.

Il eut du succès, surtout dans les forêts de montagne; à vrai dire, il avait été surtout inventé pour ces dernières.

Il eut cependant aussi ses détracteurs; et ceux-ci étaient précisément les fervents de la méthode "du réensemencement naturel et des éclaircies."

Ils faisaient remarquer que l'effet du précomptage étant de remplacer tout volume de gros bois réalisé dans les affectations hors tour, par un volume égal à déduire de celui destiné à être réalisé dans l'affectation en tour, cette dernière ne serait pas entièrement régénérée à l'expiration de la période, et qu'on détruirait ainsi la belle ordonnance de l'aménagement.

À cette objection, on répondait qu'il n'y avait pas d'inconvénient à ce qu'il restât, en fin de période, dans l'affectation, un certain volume disponible que l'on pouvait former des bois les plus jeunes, choisis parmi ceux dont la réalisation eût précisément entraîné les plus grands sacrifices.

INVENTAIRE TOTAL.

L'idée du précomptage portait en elle-même le germe d'une évolution qui ne tarda pas à se produire.

Tout en s'occupant plus spécialement de la régénération de l'affectation en tour, on s'habitua peu à peu considérer comme faisant partie de la possibilité les bois exploitables de la série entière, et à faire rentrer dans la possibilité principale même les produits réalisés au passage des coupes d'amélioration.

D'autre part, pour savoir au juste à quoi pouvait aboutir le précomptage de certaines catégories de bois, il était utile de connaître le volume de ces bois.

C'est ainsi que, lors des aménagements, au lieu de compter seulement les arbres existant dans l'affectation à

régénérer, on a été amené à faire l'inventaire du volume existant dans la série entière.

Il serait trop long et trop difficile de calculer les volumes des bois de dimensions inférieures; on ne compte donc que les bois audessus d'un certain diamètre, qui est généralement celui que peuvent atteindre les arbres parvenus au tiers de la révolution; ce diamètre est très-souvent celui de 20 *cm*.

Les arbres de dimensions supérieures sont inventoriés et cubés par catégories de diamètre, de 5 *cm* en 5 *cm*, et divisés ensuite en deux catégories, comprenant les bois moyens et les vieux bois.

Les bois moyens sont ceux dont l'âge est compris entre le tiers et les deux tiers de la durée de la révolution; les vieux bois sont ceux dont l'âge est supérieur aux deux tiers de la révolution.

L'âge des bois est arbitré d'après leur dimensions, ce qui suppose la proportionalité de l'âge au diamètre.

Il est facile de se rendre compte qu'avec cette classification, et en admettant que la série soit normalement composée, c'est-à-dire que les arbres de tous âges y occupent la même surface, le volume des bois moyens doit être à celui des vieux bois dans la proportion de 3 à 5.

De toute manière et indépendamment des déductions que l'on peut en tirer pour l'aménagement, l'inventaire total est toujours une excellente chose, parce qu'il donne une expression exacte de la richesse de la forêt, et fournit des points de comparaison utilisables dans l'avenir.

On peut remarquer que si l'on se trouvait en présence d'une série divisée en trois affectations normalement composées, les volumes des trois catégories de bois dont il été question correspondraient exactement aux volumes existants dans ces affectations; que si l'on se trouve, au contraire, en présence d'une série à peuplements irréguliers, les volumes des trois catégories représentent encore, pour ainsi dire, les éléments

épars que l'on peut considérer par la pensée, comme formant, par leur réunion, les trois affectations.

POSSIBILITE DEDUITE DE L'INVENTAIRE TOTAL.

Comment déduire la possibilité d'une forêt de l'inventaire total du matériel établi de la manière qui vient d'être indiquée? Le procédé le plus en usage est le suivant.

Les vieux bois devant être réalisés pendant le premier tiers de la révolution, on prend leur volume, on y ajoute un accroissement estimé d'une manière modérée, et on divise le total par le tiers de la durée de la révolution; on obtient ainsi le volume des vieux bois à enlever chaque année; on admet en outre que, parmi les bois moyens, on aura à réaliser la moitié de l'accroissement, l'autre moitié devant rester incorporée au peuplement.

On ajoute donc au volume des vieux bois à enlever annuellement, la moitié de l'accroissement des bois moyens, et on obtient ainsi l'expression de la possibilité totale.

Ce procédé, qui paraît mathématique au premier abord, laisse encore beaucoup à l'appréciation.

Il y a d'abord la durée de la révolution, que l'on peut allonger ou diminuer, puis il y a l'accroissement, tant des vieux bois que des bois moyens, qui peut être évalué différemment; enfin il y a la partie de l'accroissement des bois moyens destinée à être réalisée; elle a été évaluée ici à moitié, mais on peut l'estimer aussi bien au tiers ou au quart dans certains cas.

Un autre procédé consiste à prendre pour l'expression de la possibilité, le quotient du volume total existant dans la forêt par la moitié de la durée de la révolution; il faut pour cela connaître le volume total, et, comme dans l'inventaire, on ne comprend pas les bois de petites dimensions, il faut évaluer ces derniers à vue.

Pour que la formule employée fût exacte, il faudrait en outre que, pendant toute la durée de la révolu-

tion considérée, la production continuât à rester la même.

Quand on est habitué aux forêts d'une région, il est presque aussi exact de prendre simplement comme expression de la possibilité un tant pour cent du volume inventorié.

Les trois procédés peuvent être employés concurremment; il est bon de comparer les résultats fournis par chacun d'eux, et de tenir compte également de l'état de la forêt, et du rendement qu'elle a donné par le passé.

On arrive ainsi à une appréciation assez juste de la possibilité.

Le chiffre adopté sera aisément rectifié lors de la révision de l'aménagement, quand un nouveau comptage permettra d'établir la comparai-

son entre les volumes existant au début, et à l'expiration de l'espace de temps considéré.

Un des principaux avantages de l'établissement de la possibilité d'après l'inventaire total, est même de permettre des comparaisons et des rectifications de ce genre.

Il y a lieu de remarquer d'ailleurs que cette manière de procéder est indépendante du mode de traitement appliqué à la forêt, et que d'autre part, la possibilité ainsi déterminée tend à se confondre avec le rendement et la production annuelle de la forêt; car la différence entre ces trois quantités résultant de la réalisation de quelques jeunes bois, non inventories, ne peut jamais être considérable.

(A suivre.)

IRRIGATION AND IRRIGATION DEVELOPMENT IN CANADA.

By J. S. DENNIS.

(Read before the 17th National Irrigation Congress at Spokane, Wash., U.S., August, 1909).

The principle of irrigation as a means of insuring crop production is confined in Canada to the southwestern portion of the province of Saskatchewan and the southern portions of the provinces of Alberta and British Columbia. In the first two provinces irrigated land is used chiefly for the production of grain, fodder and food crops; but in British Columbia the areas are utilized for the growth of fruit. Irrigation in all these provinces is a matter of comparatively recent history, and, in fact, may be said to be the result of the past twenty years. As in the states of the Union, the first efforts towards irrigation were made by ranchers to provide water for small areas in the bottoms for the growth of fodder, or by some enterprising new settler to utilize some abandoned mining ditch to provide water for growth of crops on the area he had been brave enough to take up in what had previously been looked upon as only a mining or lumbering district.

The use of water through irrigation has now, however, extended beyond the experimental stage and has made wonderful strides during the past ten years in reclaiming large areas. In south-eastern Saskatchewan the systems, though numerous, are small and are largely confined to the areas on the north and south slopes of the Cypress Hills, and the introduction of

systems for the reclamation of large areas in that district is limited by the insufficiency of the water supply.

In British Columbia, which is a mountainous country, the water supply is bountiful, but the areas suitable for irrigation are available only in the valleys and are small in extent; and although the systems now in operation or under construction comprise many hundreds in number, the total area of irrigated land is not more than three hundred thousand acres.

SOUTHERN ALBERTA'S IRRIGABLE AREA.

It is in the great plains region of southern Alberta that the great Canadian irrigation projects are situated and there the principle of irrigation has been extended until to-day we have some 150 irrigation systems completed or under construction capable of supplying water for the irrigation of 1,750,000 acres. Several of these are of such magnitude and present such unique features in their development as to warrant special mention in a paper presented to this the most important of the world's irrigation conventions.

Southern Alberta comprises a great open plateau extending from the Rocky Mountains eastward for two hundred miles, and the portion within which irrigation is practised extends northerly from the international boundary for another two hundred

miles. This portion of the province has many fine rivers, like the St. Mary's, the Belly, the Kootenay, the Old Man, and High River, together with many smaller streams, all heading in the mountain range to the west and providing a bountiful supply of water from the melting snow or summer precipitation on that vast watershed.

The introduction of irrigation in this region began about fifteen years ago through the efforts of the ranchmen to improve the production of fodder on bottom lands by the construction of small and inexpensive ditches to divert water; and

other systems to irrigate areas from ten to fifty thousand acres were undertaken, and the Southern Alberta Land Company are now constructing a system diverting water from the Bow River for the irrigation of three hundred and fifty thousand acres.

THE C.P.R. IRRIGATION PROJECT.

The great impetus, however, was given to the irrigation development in Southern Alberta by the decision of the Canadian Pacific Railway Company in 1903 to undertake the reclamation of a vast track of land comprising three million acres, situated



Headgates of the C.P.R. Irrigation Canal, Calgary, Alta.

although southern Alberta is not an arid country in the sense that nothing can be raised without irrigation, the success attending the artificial watering of land in the valleys justified the expenditure of the larger sums necessary to divert water to the bench or higher lands where larger areas could be reclaimed.

The first of these large projects to be undertaken was that of the Alberta Railway & Irrigation Company which undertook the construction of a canal system some ten years ago for the diversion of water from the St. Mary's River for the irrigation of some 250,000 acres in the vicinity of the city of Lethbridge. Subsequently many

along the main railway line to the east of the city of Calgary. This block of land had come to the company as part of their land grant subsidy, but under arrangement with the Government has been granted in a solid block, instead of in alternate sections, so as to render the irrigation project possible; and after a large amount of preliminary surveying had been done by both the Government and the company the actual construction of the canals was commenced in 1904 and has progressed steadily ever since.

The area embraced in the Canadian Pacific Railway Company's "Irrigation Block," as it is commonly called, is bounded

on the west by the Bow River, on the east by the line between ranges 10 and 11 west of the 4th meridian, on the south by the Bow River and on the north by the Red Deer River and the north boundary of township 28. It has a length from east to west of 150 miles and an average width from north to south of 40 miles, and its magnitude may be illustrated by stating that it is larger than the states of Connecticut and Rhode Island combined, twice as large as the province of Prince Edward Island in Canada, one eighth the size of England and Wales, about the same size as the Hawaia Islands, and twice the size of Porto Rico. The area of land to be put under irrigation in the block is four times as large as the irrigated area of the state of Utah, about equal to the total irrigated area of the state of Colorado, and nearly one-seventh of the total irrigated area of the United States.

The block is an open prairie plateau, with a general elevation at its western boundary of 3,400 feet above sea level, and slopes rapidly to the eastward until an elevation of 2,500 feet is reached at the eastern boundary. The surface throughout is more or less rolling until the eastern section is reached, where large areas of almost level plains are found. The soil is good, with a heavy black loam and clay sub-soil in the western portion, and a lighter sandy loam with good sub-soil in the more easterly portions.

The portion of Southern Alberta within which this vast block of land is situated is not, as has already been said, arid in the sense that nothing can be raised without irrigation. The average rainfall for a series of years has been about fifteen inches, but this moisture is not always available when most needed by the growing crops; and it is recognized that without irrigation certain crops cannot be raised, and that in any year the certainty of crop production is assured by having water available to irrigate when necessary.

In developing this irrigation project the block was divided into three sections, eastern, central and western, containing about 1,000,000 acres each, and the construction of canals and incidental colonization is being carried on along the lines of development of the sections separately, beginning with the western.

The general engineering surveys so far completed indicate that of the total area about 1,200,000 acres can be irrigated, of which 350,000 acres are situated in the western section. The water for the irrigation of land within this block is diverted from the Bow River at two main points, the most westerly being situated about two miles below the city of Calgary and the most easterly about fifty miles east of that city. In the western section the construction of canals and ditches is well advanced

towards completion. At the close of the year 1908 some 1,150 miles of canals and ditches were completed, and during the present year 500 miles of additional canals and ditches will be constructed, giving a total of 1,650 miles of waterway within that section of the block for the irrigation of the 350,000 acres of land mentioned in the western section.

The engineering surveys indicate that about the same amount of canals and ditches will be required in each of the other sections; and the completed scheme will, therefore, comprise the construction by the company of some 5,000 miles of waterway at a total estimated cost of \$9,000,000.

In designing and constructing this project the company has departed from the usual practice on this continent of building only the main and secondary canals to deliver water to the area to be irrigated as a whole, and then leaving it to the purchasers of the land to get together and build the distributing ditches to supply water for the irrigation of the individual farms. In this undertaking not only the main and secondary canals are built, but also the vast system of distributing ditches so as to provide for the delivery of the water at some point on each quarter section of land offered for sale.

The land is sold from maps which enable the purchaser to see exactly where the water is to be delivered on the boundary of his quarter-section, and these maps also show from actual contour surveys the area which is irrigable on each 160 acres. This feature of the undertaking has necessarily added immensely to the engineering work but it overcomes any future difficulty as to areas that are irrigable or questions in connection with the delivery of water to the individual purchasers.

The irrigation project of the Canadian Pacific Railway Company from the standpoint of area included in the block, area to be actually irrigated and mileage of canals and ditches constructed, may, I think, be spoken of as "America's Greatest Individual Irrigation Project." It was undertaken by the railway company with the object of transforming a vast area, then unsettled and non-traffic-producing, into a closely settled and prosperous farming community with the attendant heavy traffic that always results from such districts.

CANADA'S IRRIGATION LAW.

In Canada we are, of course, confronted in our irrigation development by many of the problems which have been so ably discussed at the meetings of the National Irrigation Congress, and we recognize the great work which has been done by the Congress in arriving at a solution of these difficulties. Fortunately, however, we

have not been hampered by the serious drawback of litigation regarding water rights which has been the cause of so much trouble in most of the irrigated states south of the boundary.

We recognize that the permanency of title to water to be used in irrigation should be the first consideration to the purchaser of an irrigated farm. Fortunately our law relative thereto, which I might point out to you has on two separate occasions by resolution of this Congress been affirmed to be the best law extant, has been so framed as to overcome the many difficulties met with by the irrigated states south of the boundary. Its operation will be readily understood from the statement that, while our law has been in force for some fifteen years, and all our irrigation development has been carried on under its provisions, we have not up to date had one lawsuit relative to water rights.

The Canadian law relative to the use of water for irrigation differs from the American law in that it vests all water in the Crown, and only by making proper application for it and obtaining authority direct from the Government can this water be diverted from any source. The law also prevents the over-recording of streams, which has been such a marked source of trouble and litigation in the irrigated states to the south. In Canada the Government keeps a debit and credit account for each stream, the credit being the amount of water shown to be available by the Government gaugings and the debit the records granted from time to time by the Government against such supply. When these balance, no more records are granted and, as heavy penalties are provided for the diversion of water without authority, there is no possibility of over-recording streams or building canals and ditches for which there is no water available.

Under the provisions of our Canadian law the purchaser of an irrigated farm gets practically the same title, direct from the Crown, for the water he is to use that he gets for his land, and there is no chance of his being called upon to take any legal proceedings to protect his title as is often the case elsewhere.

The law is also strong in that the duty of water, or the amount of water to be supplied for irrigating a given area, and the irrigating season during which water is to be used, are both fixed by the law; and nothing is left to the whim or judgment of the company or individual selling water as to the amount of water to be supplied or the period of such supply.

Our irrigation development in Canada is, of course, a matter of comparatively recent years as compared with the development which has been the result of so many years' effort in the states south of the international

boundary, but in dealing with this problem we are endeavoring to handle it along the lines of the greatest benefit to the greatest number, and with the special object of creating in those provinces above mentioned permanent and prosperous homes where the introduction of the principles for which this Congress stands will result in a marked movement from the overcrowded centres back to the land.

We recognize, and I am pleased to have this opportunity of expressing to this Congress, our great debt for the vast amount of information which we have been able to obtain from the discussion before this Congress and from the different publications of the states within which irrigation is practised. In attempting to arrive at the desired end in western Canada and on behalf of the Company which I represent and of my fellow Canadian delegates I desire to express our keen appreciation of the great work which this Congress is doing in connection with the development of western America on a homemaking basis; and would say that as far as in our power lies we will appreciate the opportunity at any time of doing any thing we can to assist and advance the great work which this Congress has in hand, and which, in my opinion, is to day the most important work in connection with the development of western America that is being undertaken by any body of men.

The Congress may be interested in knowing that we are trying to follow in your footsteps by holding annual meetings for the discussion of problems connected with irrigation and have organized the Western Canada Irrigation Association which closed its third annual meeting at Lethbridge last week. We feel that only by getting together from time to time can we hope to deal intelligently with the many questions connected with this great movement, and if we in Canada can accomplish a small measure of the success which this National Irrigation Congress has reached in aiding the homeseeker to attain that home on a basis of permanency and future happiness, we will owe the National American Congress a further great debt for having marked the way in which we, like you, can benefit our fellow men and assist in building up on the western portion of this continent a happy, contented and prosperous home-loving people.

Some interesting developments in forestry in Ontario—among them the planting of the waterworks catchment area by the City of Guelph Water Commissioners and further progress in the Northumberland-Durham scheme for planting of waste lands in these counties—are held over for treatment in the next issue.

THE SECRETARY'S TRIP IN NEW BRUNSWICK.

On February 2nd the secretary left for Fredericton and began the making of arrangements for the annual convention. As soon as a number of details had been settled at Fredericton he left on a trip to various provincial centres. In all he held six lectures as follows: At Woodstock in the north-west, at St. John in the south, at Sackville and Moncton in the east and at Chatham and Campbellton on the North Shore. At Woodstock the lecture was held under the auspices of the Canadian Club, with Rev. George Ireland, the vice-president of the Club, in the chair. At St. John and at Moncton the meetings were also under Canadian Club auspices. At the former the president, Mr. M. E. Agar, occupied the chair, and at the latter the president, Mr. R. A. Borden, presided. At Chatham the meeting was held in the commodious new hall of the Natural History Society, Mr. J. L. Stewart presiding. The success of the meeting was largely due to the work of Dr. Baxter, the secretary of the society, and Mr. W. B. Snowball, a director and ex-president of the Canadian Forestry Association. At Sackville the Board of Trade arranged the meeting and Dr. W. W. Andrews, of Mount Allison University, introduced the lecturer. At Campbellton, also, the Board of Trade arranged the meeting in the Opera House and His Worship Mayor Murray made a very appreciative introductory address.

Good audiences attended all these meetings, and they doubtless had much effect in securing the large and enthusiastic attendance which characterized the Fredericton meeting.

The secretary then returned to Fredericton and made the final arrangements for the convention and the meetings connected therewith. In these he was greatly assisted by Hon. W. C. H. Grimmer, Surveyor-General; Lieut.-Col. T. G. Loggie, Deputy Surveyor-General; Mr. R. S. Barker, Secretary to His Honor the Lieut.-Governor; Dr. C. C. Jones, Chancellor of the University of New Brunswick; Mr. H. V. B. Bridges, Principal of the Provincial Normal School, and Mr. R. B. Miller, Professor of Forestry, University of New Brunswick.

Owing to the fact that about two hundred people were turned away from the illustrated lecture in the Civic Opera House by Mr. A. Knechtel, Inspector of Dominion Forest Reserves, the secretary agreed to give his lecture in the same place on the Monday evening following the convention. The Opera House was again filled with a very appreciative audience. Mr. T. B. Kidner, Superintendent of Manual Training for the Province, was the very efficient chairman of the evening.

After a few days spent in closing up matters at Fredericton the Secretary went to St. John and gave as much time as possible to seeing prominent citizens and interesting them in the work, until it was necessary for him to return to Ottawa for the annual business meeting. In this he received the cordial assistance of Mr. A. M. Bouillon, District Engineer G. T. P., Dr. G. U. Hay and Mr. Wm. McIntosh, Curator of the Natural History Museum. Everywhere the secretary was cordially received and great interest was manifested in the work of the Association.

NOTES.

The "Log Picking Association" has for its object the gathering of logs lost in the Georgian Bay. At its annual meeting in Toronto recently it was reported that \$53,000 worth of such logs had been saved during the past three years.

LECTURES BY MR. A. KNECHTEL, Inspector of Dominion Forest Reserves, spent the greater part of the month of March in a lecture tour of Western Ontario. Among the places visited were Toronto, Hamilton, Guelph, Stratford, Collingwood, Brussels, Ripley, Woodstock and Ingersoll. The tour was under the direction of the Forestry Branch of the Department of the Interior. Mr. Knechtel has also lectured during the winter in Ottawa (several lectures), Hull, Brockville, Newboro and Perth, in Ontario, and at Fredericton, N.B., during the convention there.

FORESTRY ENGINEER, French Swiss, 26 years of age, having the diploma of the Federal Polytechnic School in Zurich, late pupil of the School of Forestry in Munich, 2 years' practice, knowing French, German and English, seeks good and permanent situation either as manager of a wooded estate or as working manager or technical expert, in a timber business or other similar post. Copies of testimonials and diplomas if desired. Please Address N 15270 L. Haasenstein & Vogler, Lausanne, Switzerland.

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Photo by A. Mitchell, 1908

Interior View of old Tree Claim Plantation near Morden, Man.

(See article on "Some Manitoba Tree Claims" in Dec., 1909, Journal.)

NOTES.

CANADA'S FOREST PRODUCTS. The latest bulletin of the Forestry Branch, Department of the Interior, is entitled "Forest Products of Canada, 1908." It was compiled by Messrs. H. R. MacMillan and G. A. Gutches, and is No. 8 of the series. The production of lumber, lath, shingles, cross-ties, poles and pulpwood is given for the whole Dominion and also separately for the provinces; the amount and value of each species of trees are also given. Lack of space forbids longer mention of it at present. Copies can be obtained free on application to R. H. Campbell, Superintendent of Forestry, Ottawa, and may be had either in French or in English.

CONSERVATION COMMISSION ACTIVE. The activities of the Commission of Conservation, under the able guidance of its chairman, Hon. Clifford Sifton, have been very much in evidence of late, especially in regard to proposed legislation in regard to waterpowers. In the opposition to the Long Sault and Fort Frances power schemes the hand of the commission has been evident, and a study is now being made of forest fires especially along the National Transcontinental Railway in Ontario.

DOMINION FOREST SERVICE. During the coming season the Forestry Branch of the Department of the Interior will have six survey parties in the field, each to consist of a forester-in-charge, three assistant foresters and a cook. Of these parties two will be in the railway belt in British Columbia, two on the eastern slope of the Rockies, and two on the route of the Hudson Bay Railway. The work of tree distribution from the Forest Nursery at Indian Head will be continued as in former years. The number of fire rangers will be considerably increased.

QUEBEC FORESTRY SCHOOL. Special mention was made in the Speech from the Throne recently delivered at the opening of the Legislature of the Province of Quebec of the foundation of a school of forestry in the province. Legislation will be introduced at the present session to give effect to this. A number of young men now in the service of the provincial department of lands and forests will enter the school at its opening, after some months spent in practical work in connection with the department.

ONTARIO'S FOREST REVENUE. Ontario's total revenue from Woods and Forests during the ten months ending October 31st, 1909, was \$885,892.44, made up as follows: Bonus, \$285,571.41; Timber Dues, \$529,422.50; Ground Rent, \$68,528.53; Transfer Fees, \$2,370.00. The revenue from timber dues is for ten months only, and, as many of the accounts did not fall due until December 1st, are small as compared with some other years.

In the Mississaga forest reserve, Ontario, the timber damaged by fires in 1909 is put down as seventy-five million feet. The fire which injured the reserve came up from licensed lands to the south, and it was found impossible to ascertain the cause of the fire or fix the responsibility for it. Small quantities of red and white pine, both Crown and private property, on the Timagami reserve were also damaged.

Senator Davis, of Prince Albert, has introduced into the Senate a bill to amend the Dominion Lands Act, with the object of enabling a homesteader to fulfil part of his homestead duties by the planting of trees. The bill proposes that, within certain areas which may be judged by the Governor-General-in-Council to be suitable for tree culture, if any entrant on applying for a patent can prove that there are on his homestead one thousand healthy trees, planted by him, of not less than one inch in diameter, this shall be taken as equivalent to half the amount of cultivation usually exacted.

BROWN TAIL MOTH. Inspection of all imported nursery stock, in order to prevent the spread of the

Brown Tail Moth, is being continued this year under direction of the Division of Entomology of the Central Experimental Farm, Ottawa. Last year over a million and a half imported seedling plants were examined and 196 nests were found. This year, as last year, all the nests have been found in imported French nursery stock. In Canada, so far, the pest has not spread beyond Nova Scotia. An account of the insect is given in the last report of the Experimental Farms.

Dr. J. F. Clark's many friends will be interested to know that he has entered business on his own account in Vancouver, under the style of J. F. Clark & Co.

Canadian Forestry Journal



IN A BRITISH COLUMBIA FOREST, NEAR MOUNT BENSON.

Photo F. T. Shutt, M.A.

JUNE 1910

Canadian Forestry Journal

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Canadian Forestry Journal

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No. 2.

CONVENTION POSTPONED.

In the last issue of the CANADIAN FORESTRY JOURNAL it was announced in good faith that the expected forestry convention would be held in conjunction with the meeting of the Commission of Conservation at some point in Quebec during the

second week in June. Circumstances arose later that caused the Commission of Conservation to alter their plans and cancel the June meeting; consequently the forestry convention was also postponed. The dates will be announced later.

NOTES ON NORTH AMERICAN FORESTRY.

By Prof. W. Somerville, Oxford University, England, in the Quarterly Journal of Forestry for April, 1910, (Vol. 4, No. 2).

Last year chance took me twice to North America. My first visit, in August and September, was chiefly confined to Canada, my second, in December, being to the Southern Appalachian Mountains, on the borders of Virginia, North Carolina and Tennessee. I cannot claim to have much that is new to tell, but at the request of the Editor I will gladly note down some impressions.

Sailing up the St. Lawrence, from the time that the New Brunswick coast is fairly visible, what strikes one at once is the large proportion of forest that has been burned. When one gets accustomed to the appearance of a burned forest one can recognize this state of things almost at any distance. All the smaller trees have been utterly consumed, but the large ones have lost their branches only, the stem remaining standing for years, dead and bleached. The first impression of Canadian forests was one that became emphasized as one journeyed westwards. Not until the Rockies were crossed did the train come in sight of a virgin forest that had not been felled or burned; and even in the humid climate of the Selkirk Mountains, and British Col-

umbia generally, it was rare to see an unburned forest. The causes of conflagrations are many, but the railway is the chief offender, and as the train labored up a steep incline, one could often see, looking back, that we were leaving fresh outbreaks of fire behind. There are laws both in the States and in Canada with regard to spark catchers on locomotives, but apparently they are generally disregarded. The Canadian Government is now realizing the extent of the loss that the country suffers annually through the needless destruction of timber, and a system of forest guards has been established, which already is making itself felt, and which will, in time, be of great service. If forest fires are common in virgin forest, they are still more so on cut-over land, where the top and lop is almost as combustible as dry gorse. In few cases does one, east of the Rockies, see any good natural regeneration of valuable species, the Spruce, Hemlock and Pine forests being succeeded, for the most part, by comparatively worthless Poplar (*P. tremuloides*) and Birch. In British Columbia, however, valuable trees (*Thuja plicata*, Douglas Fir, *Picea Engelmanni*) would

rapidly re-clothe the ground were fires prevented. In the hardwood forests of the Appalachians fire does but little harm to mature forest, there being but little underwood to feed it. In autumn and spring the dead leaves that cover the ground are sometimes run over by fire, but the damage done is not serious. The case, however, is different on an area that has been logged. All the best trees have, of course, been removed, but the young growth and saplings have been left, and these would rapidly furnish another crop of timber if they were allowed to remain. But it seldom happens that cut-over land is spared by fire, with the result that enormous tracts of country are now little better than a wilderness.

In the Government Report on forest fires in Canada in 1908 it is stated that "The scarcity of valuable timber in Canada is due more to its destruction by forest fires than to any other cause," and certainly a visitor to the Dominion is much impressed by this waste.

The eastern forests of Canada extend nearly to Winnipeg, but west of that city the prairie almost monopolizes Manitoba, Saskatchewan and a large portion of Alberta. The numerous settlers who annually set up homes there have to fetch building timber from long distances, much of it now coming by the Canadian Pacific Railway from British Columbia. Although it is undesirable, even if possible, to create forest on prairie land, still much interest is taken in tree planting for fencing, shelter, and firewood; and at Regina, the capital of Saskatchewan, I had the pleasure of attending a two-days' Conference of the Canadian Forestry Association.

Some two hundred people took part in the meeting, and the interest and enthusiasm were unmistakable. The Department of Agriculture for the Dominion established an Experimental Farm at Indian Head in 1888, and since then the propagation of trees capable of growing in this district of low rainfall has been an important

feature of this work. During recent years about 100,000 young trees* have been distributed annually, free to settlers, and already many homesteads are surrounded by well-grown shelter belts. The *Acer Negundo* and American Ash have proved most suitable amongst the hardwoods, while as regards conifers it was interesting to find that Norway Spruce, Scotch Pine and European Larch had done quite as well as any native species. But in this country of low rainfall success can be secured only by ploughing the land before planting, and by keeping it tilled for some years afterwards.

Between Lake Superior and Winnipeg the conifers that one sees most are *Picea mariana* (*nigra*), *Pinus Banksiana* (*divaricata*), and *Larix americana*; but when one enters the Rockies the first is replaced by *Picea Engelmanni*, and the second by *P. contorta*, var. *Murrayana*, while the larch gets scarce, and finally disappears. I cannot be sure that I saw *Larix occidentalis* at all, although its northern limit is about the Canadian Pacific Railway, but on the mountain above Lake Louise, at an altitude of some 5,000 feet, I got amongst numbers of Lyall's larch (*L. Lyallii*), a very poor tree, and one of no economic value. *Picea Engelmanni* is the chief spruce of the mountains, while the Western Hemlock (*Tsuga heterophylla*) (*albertiana*) and the Giant Thuya form a large proportion of the other conifers, to which, lower down, are to be added Douglas fir, *Pinus monticola*, and *Picea sitchensis*. Above Glacier, at an altitude of some 7,000 feet, *Tsuga Mertensiana* (*Pattoniana*) and *Pinus albicaulis* were met with, associated with *Abies lasiocarpa*. The lower slopes of the mountain were largely clothed with the Western Hemlock.

*These figures refer to the free tree distribution from the Experimental Farm at Indian Head. The number of trees sent free from the Forest Nursery Station at the same place to settlers throughout the prairie provinces has for years averaged from two million to two and a half million per annum.—Ed.

which there attains large dimensions. The hemlocks generally reproduce themselves very freely in North America, and even in Britain, as at Murthly and Dropmore, seedlings come up naturally in large numbers. In the lower valley of the Fraser River and especially in the park at Vancouver, the Douglas fir, Giant Thuja, Sitka spruce, *Abies grandis*, and the Sitka cypress reach large proportions. It did not strike me, however, that the growth was any better than, if indeed it was so good as, is to be seen under suitable conditions in this country.

At Ottawa, Vancouver, Victoria and elsewhere, I had the opportunity of seeing large sawmills, and the rapidity and ease with which the largest logs are brought to the saw bench, and handled there, was a revelation. In most cases the logs are floated, in many instances for hundreds of miles, to the foot of an inclined plane, up which they are transported by endless chains to the saw bench. Even where floating is not the

means of conveyance it is found desirable to construct a pond, into which the logs are thrown from the trucks. The pond serves many purposes. In the first place it is the means of clearing the logs from adhering grit, it offers the most convenient opportunity of sorting the timber, and it is a suitable place of storage for logs that it is desirable to hold over for some months. From any lot of timber felled in a virgin forest a considerable proportion is "pumped," "wormy," "foxy," or otherwise defective, and to get the largest proportion of sound, or fairly sound, boards, the logs have to be frequently turned over on the saw bench. This is done by means of a steam "nigger," which takes various forms, but is often a great notched bar of iron that comes up from below the bench at the will of the operator, and turns over and otherwise manipulates logs weighing a ton or more as easily and quickly as a man could move corks.

THE BROWN-TAIL MOTH IN CANADA.

BY C. GORDON HEWITT, D.Sc., DOMINION ENTOMOLOGIST.

Although the Brown-tail Moth (*Eu-proctis chrysorrhæa*), which was introduced into Massachusetts from Europe about 1890, has spread rapidly into the adjacent eastern states, causing great destruction to fruit and shade trees and physical suffering to the inhabitants and involving an annual expenditure of thousands of dollars, it was not until 1907 that the first winter web of the caterpillars of this insect was found in Kings County, N.S., and sent to the Division of Entomology. This discovery was an indication that the brown-tail moth had established itself in Canada.

Realizing the serious results that would follow its spread in Nova Scotia the Department of Agriculture for Nova Scotia instituted a campaign which has been continued against the

insect, and many thousands of nests have been destroyed annually in Kings, Annapolis and Yarmouth Counties which were found to be infested with the insect. This prompt action cannot be too highly praised.

Stray specimens of the male moths have been found since 1902 in New Brunswick, but as yet no signs of the insect having gained a foothold have been observed in that province.

Early in 1909 the winter webs, which the young caterpillars spin and in which they pass the winter in colonies of several hundreds, were found in New York State on nursery stock imported from France. The Division of Entomology at Ottawa was advised of this fact and steps were immediately taken to have all European nursery stock imported into

Canada carefully inspected for these winter webs, in which stage the insect is most easily distributed but also most readily destroyed. Over a million and a half plants were examined and nearly two hundred winter webs were found on French stock.

This inspection which, in the absence of the necessary legislation, was carried on with the voluntary co-operation of the nurserymen importing the stock, is being repeated, and during the present season which is now closing over three hundred webs, representing probably several hundred thousands of caterpillars, have been found in more than two million plants inspected.

With the co-operation of the Customs Department, of the U.S. Bureau of Entomology and of the New York State Department of Horticulture, the Division is advised of all shipments of European nursery stock, and these are inspected at the points of destination. So far as we can judge this careful inspection, in which we have been assisted by the Departments of Agriculture of the provinces concerned, has prevented the introduction of the moth in nursery stock, in which manner it was first introduced into this continent.

Owing to the absence of the parasitic insects which keep it in check in Europe, where it is common but only occasionally seriously injurious, it has spread with astonishing rapidity. Being carried chiefly by the prevailing winds it has spread northwards into Vermont, New Hampshire and Maine, and is now within a hundred miles of the Canadian frontier.

As a result of a thorough inspection of the infested region in Nova Scotia the writer is of the opinion that its control is possible by a thorough and systematic inspection and the destruction of all the winter webs, and that by prompt action the insect may be prevented from spreading into the forest and wild thickets. The caterpillars feed on hardwoods such as oak, maple, elm, ash, etc., in addition to

cultivated and wild fruits and thorn. Its establishment in the forests would render control impossible.

Circumstantial evidence supports two theories to explain its introduction into Nova Scotia: the chief means appear to be vessels trading between such ports as Bridgetown, Bear River, Digby, etc., and the port of Boston. One infestation could be explained only by the remarkable fact that the moths are carried across from Massachusetts to Yarmouth County, N.S., by the wind; this has been found to occur, but practically all the moths so carried are males.

This insect presents one of the most serious problems with which the Division of Entomology is and will be confronted. In the Eastern States it was allowed to assume large and uncontrollable proportions before action was taken, with the result that it soon spread over several thousand square miles, and now the only hope lies in the establishing of the parasites which are being imported from Europe, reared and released. Several species have become established, and it is hoped that by these means the insect will be ultimately controlled, by which time, however, it is safe to prophesy that it will have reached and crossed the Canadian frontier.

NOTE.

ONTARIO'S NEW REGULATIONS. The Provincial Government of Ontario has announced several important changes in their timber policy. Ground rents have been increased to \$5.00 per mile. The stumpage dues on pine have been increased from \$1.00 per thousand feet to \$1.50. On square and waney timber the dues have been increased from \$20.00 per thousand cubic feet to \$50.00; the purpose of the regulation is to discourage this extravagant use of the timber. The entire cost of fire ranging is to be borne by the license holders, instead of half being paid by the government, as formerly. The fee for the transfer of a license is raised from \$1.00 to \$5.00 per square mile, and 25 cents per thousand is added to the stumpage dues for hemlock. It is also provided that these regulations shall remain as at present for ten years.

NOUVELLES TENDANCES ET MÉTHODES D'AMÉNAGEMENT

(TRAVAIL PRÉSENTÉ AU CONGRÈS INTERNATIONAL D'AGRICULTURE A
VIENNE, EN 1907, SECTION DE LA SYLVICULTURE.)

Par M. de Gail, Conservateur des Eaux et Forêts à Epinal, France.

(Suit et fin.)

METHODE DU QUARTIER DE REGENERATION.

Pour aménager une forêt d'après cette méthode, il faut tout d'abord procéder aux opérations préliminaires de tout aménagement, à la division en parcelles et au choix de la révolution.

Pour établir les parcelles, il convient de tenir compte plutôt de la nature des lieux que de celle des peuplements, et de choisir, autant que possible, des limites d'un caractère permanent, telles que crêtes, lignes de fond, chemins, etc.

La révolution n'a pas ici une durée aussi précise que celle qui lui est assignée dans le système des affectations; le chiffre qui l'exprime est bien l'âge des bois ayant atteint la dimension d'exploitabilité, mais ce chiffre n'intervient que comme un facteur dans le calcul de la possibilité.

Ces opérations préliminaires terminées, on procède à l'inventaire du matériel total de la forêt, et on en déduit la possibilité comme il a été indiqué précédemment.

C'est seulement à partir de ce moment qu'intervient le choix du mode de traitement.

Si l'on veut obtenir une futaie régulière, se rapprochant de celles qu'on a l'habitude d'envisager en appliquant la méthode des affectations, on établira un quartier de régénération.

A cet effet, on choisira, sans s'astreindre à ce qu'elles soient contigues, les parcelles dont les peuplements sont les plus aptes à être régénérés, et on prescrira de procéder à leur régénération pendant un certain laps de temps, qui ne sera pas forcément une partie aliquote de la révolution.

L'ensemble de ces parcelles formera le quartier de régénération ou seront assises, par volume, les coupes d'ensemencement, secondaires et définitives.

Sur le surplus de la forêt ou de la série, on assoiera par contenance des coupes d'amélioration, en opérant dans chaque parcelle, comme l'exige la nature du peuplement.

On peut, si on le désire, classer ces parcelles hors quartier, suivant l'ordre dans lequel on suppose qu'elles pourront être régénérées.

On peut même, si la durée considérée est une partie aliquote de la révolution, et si le quartier de régénération possède une étendue en rapport avec cette durée, établir un classement par affectations; dans ce cas, la méthode du quartier de régénération se confond à peu près avec celle des affectations, modifiée par le précomptage.

Pour appliquer un aménagement de ce genre, il faut chaque année, avant de marquer la coupe principale, établir le bilan des produits accidentels réalisés depuis l'année précédente, y ajouter le volume marqué dans la coupe d'amélioration de l'exercice, qui doit être martelée avant la coupe principale, et déduire le total de ces volumes du chiffre de la possibilité. On obtient ainsi le volume à enlever par la coupe de régénération.

Il peut résulter de cette manière de faire un inconvénient, c'est que le volume enlevé dans les parcelles hors quartier soit assez considérable pour réduire jusqu'à rien les coupes de régénération, et pour retarder ainsi au delà du terme désirable, la régénération du quartier désigné.

Mais cet inconvénient ne peut se produire que de deux manières: ou bien il résultera de réalisations forcées, telles que des exploitations de chablis, de bois dépérissants etc., et alors il n'y aura qu'à s'incliner, car il n'y a jamais lieu de sacrifier le bon état d'une forêt à des spéculations d'aménagement; ou bien il proviendra d'opérations mani-

festement exagérées, et alors il sera toujours possible d'amener à une plus saine conception des choses ceux qui auront effectué ces opérations.

METHODE DU TRAITEMENT VARIE.

Nous employons cette appellation de "methode du traitement varié" pour donner un nom à un mode de traitement qu'on désigne souvent improprement sous le nom de "jardinage modifié," alors qu'il n'a rien de commun avec le jardinage proprement dit.

Ce mode de traitement peut être appelé "varié" parce qu'il comprend, sur une surface souvent restreinte, des opérations de toute nature, appropriées à l'état des peuplements.

Il s'applique surtout à des peuplements irréguliers.

On peut être amené à effectuer, dans une même parcelle, par taches, des coupes d'ensemencement, secondaire, définitive, d'extraction, d'éclaircie, de jardinage.

Pour aménager une forêt destinée à être traitée de cette manière, on procède, comme il a été indiqué à propos de la méthode du quartier de régénération, à la division en parcelles, au choix de la révolution, à l'inventaire général du matériel, et à l'établissement de la possibilité.

Il ne reste plus ensuite qu'à déterminer l'ordre dans lequel les différentes parcelles devront être parcourues, et la durée que l'on devra employer à les parcourir.

Cette durée, qui est l'espace de temps moyen qui doit séparer deux passages consécutifs des coupes dans une même parcelle, est désignée sous le nom de rotation; elle est le plus souvent de dix ou de douze ans, et peut s'appeler alors "décennie" ou "duodécennie."

Dans l'application de cette méthode il arrive souvent que les coupes sont en retard, par suite de réalisations exagérées dans certaines parcelles, et qu'en conséquence la série entière n'est pas parcourue pendant la durée de la rotation.

Il y a là un inconvénient très-grave.

Pour y remédier, on fait intervenir la contenance jusqu'à un certain point dans la marche des coupes; c'est à dire qu'en se basant sur le matériel existant dans chaque parcelle, on détermine, par un calcul de proportion, la part de possibilité que doit fournir la parcelle pendant la rotation.

On établit ainsi pour chaque parcelle une sorte de possibilité partielle, dont le recrutement n'a cependant pas le caractère strictement, obligatoire qui est imposé à la réalisation de la possibilité totale.

Des transferts de parcelle à parcelle sont permis; le contingent à fournir par chacune d'elles n'est donné qu'à titre d'indication.

C'est surtout l'obligation de déduire du volume des coupes les produits accidentels, qui ne permet pas de fixer d'une manière incommutable le contingent à fournir par chaque parcelle.

CHOIX D'UNE METHODE D'AMENAGEMENT.

Le forestier chargé de procéder à l'aménagement ou à la révision de l'aménagement d'une forêt doit se garder de toute idée préconçue, de tout parti pris.

Seule, l'étude approfondie de la forêt doit l'inspirer et le guider dans le choix de la méthode à employer.

Si l'ancien aménagement a donné des résultats satisfaisants il faut le conserver; la continuité est un point capital dans le traitement d'une forêt.

Dans maints endroits, notamment en plaine, dans des forêts de feuillus, la méthode des affectations a réussi. Il faut l'y conserver. S'il s'agit d'essences dont la régénération doit être menée rapidement, si d'autre part il n'y a pas de grosses exploitations accidentelles à craindre, il ne sera même pas nécessaire de baser la possibilité sur le matériel total. On peut le faire cependant sans changer le plan général.

Dans beaucoup de forêts, malheureusement, la méthode des affectations n'a pas donné d'aussi bons résultats, et il serait difficile au forestier le plus expert, de dire, à l'aspect des peuple-

ments, dans quelle affectation il se trouve.

Ce sera alors le cas d'employer, soit la méthode du quartier de régénération, soit celle du traitement varié. On adoptera la première, si l'on dispose d'un nombre suffisant de parcelles renfermant des peuplements aptes à être régénérés, pouvant constituer un quartier de régénération, ce dernier dût-il ne pas être d'un seul tenant.

On aura recours à la seconde dans le cas contraire.

En tout état de cause, l'aménagement d'une forêt doit être établi de telle manière qu'il permette d'appliquer aux peuplements de toutes les parties de la forêt le traitement qui leur convient le mieux et de les mener ainsi dans les conditions les plus favorables jusqu'à leur terme d'exploitabilité.

BRITISH COLUMBIA TIMBER PROBLEMS.

By A. G. LANG.*

Since the publication in the CANADIAN FORESTRY JOURNAL of the views of Prof. Roth and of Dr. Clark, the Government of British Columbia has definitely granted to special license holders extension of tenure during such time as there remains on the limits merchantable timber. The Government, therefore, has neither adopted Dr. Clark's recommendation to grant permanent tenure of timber lands, nor has it gone to the opposite extreme as advocated by Prof. Roth.

To hasten direct government administration of the timber areas must ever be the mission of the forester. His desire is to see the government sell logs, but not limits; sell trees, but not in unknown quantities. It is only the forester, too, who realises how hard is the task of imposing conservative methods on private holders. But ideal methods are possible only under ideal conditions. While any views expressed by Prof. Roth must ever be received by foresters with the heartiest respect and interest, in the

prevent destruction and waste, no great harm can result from limited tenure, but without adequate government supervision the time limit is utterly wrong and dangerous. As there is still no immediate prospect of such adequate supervision, the safer plan was to drop the limited tenure feature of the licenses.

Coming down to actual practice, on the ground of immediate effective conservation, much can be said in favor of extending the time for cutting on lands already licensed. Consider how immense are the timber areas of British Columbia and how extensive and scattered the lumbering operations, coupled with the fact that there are no trained foresters and that fire wardens are still political appointees. Neither here nor elsewhere can an efficient service of forest police be organized within a short space of time, but meanwhile by granting extension the good-will of the lumberman was secured, and every inducement given him to log less wastefully and to keep out fire.

Probably Prof. Roth did not learn that in this province the speculator by no means always got the best of the deal. The excitement of the boom led to a lot of poor timber and many overlapping claims being staked, from which, of course, the full fees were, and are still, received. But in any case the speculator in

*Mr. A. G. Lang, the author of the above article, is a graduate of the Royal Forest Academy at Muenden, Prussia. He has had considerable practical experience as forester, both in Scotland, his native land, and in Germany. A residence of over a dozen years in British Columbia, along with his training in forestry, qualifies him to speak with some authority on the subjects of which he treats. He now lives at Waneta, B.C.—Ed.

present case it must be submitted as probable that a closer study of local conditions would have led to modified opinions regarding the main point at issue. It is very doubtful if refusal of extension to license holders would have been to the advantage of the people or of the forest. Everything hinges on the question of supervision. Given an organized forest service to transferable licenses must always be considered the lesser evil. He at any rate pays his dues and must help conserve the forest, whereas fire, waste and the destruction of young growth not only reduce revenue, but may have ill effects reaching far beyond the mere question of wood crops.

The conditions, regulations and restrictions by which the extension of tenure shall be accompanied have not yet been made public. Fortunately there is every reason to feel confident that, in this and other questions, the final recommendations of the Timber and Forestry Commission will tend to essentially further the future welfare of the province. Meanwhile, where there is a prospect of reasonable safety from fire and where a large and increasing revenue is assured, as long as the Government retains full power of control over regulations and fees there is, in view of conditions prevailing elsewhere on this continent, little cause for grumbling.

As extension of tenure is a very big and valuable concession to the limit-holders, the Government may rightly in turn look for concessions from them. Amongst other things the Government may well require that all limits shall be surveyed and mapped within a reasonable time. This is at present optional before logging begins, but is immediately desirable in view of the introduction of more orderly methods and improvements in forest policy.

At present the speculator is in hiding behind the man the Government can have no desire to hit, but every desire to encourage, viz., the intending operator. Everyone knows this

dealer in transferable licenses is there, and everyone wants to see him hit, but how can that be done without crippling the lumberman? Neither an all-round raise of the license fee nor an additional tax on limits not being operated would meet the case, but a probably feasible means to the desired end would be the levying of a tax on sales or the imposition of a good stiff transfer fee. Naturally sales will in the future tend more and more towards a solid business basis. It is the present holders and some of the first purchasers from them who will make the unreasonably big sale profits.

LICENSE FEES.

In reality timber licenses pay no taxes at all. To Dr. Clark's: "The high license fee is essentially a method of paying for the timber on the instalment plan," one may add: "The so-called royalty tax is simply the balance of the price." The lumberman in the States has paid for and owns his timber outright, so that his government dues are no more than ordinary taxes. But the license holder in this province has not yet settled up with the Government, and where, as is often the case, the timber is worth \$50.00 and more per acre it cannot be said that payment by annual instalments of 22 cents per acre is very oppressive. After the licensee has paid a total in fees equalling the fair value (less royalty still due) of the timber, then a reasonable tax rate might well be substituted for the license fee.

The present method of levying fees works well for the Government as regards obtaining a fairly large and steady income with little trouble, but, as Prof. Roth points out, it is based on an unsound and unfair system seeing that the holder of a poor or inaccessible limit, awaiting better prices and transportation, may have to pay twice or thrice as much for his timber as the holder of a good limit on salt water who, in order to escape further fees, logs at once.

It would probably be quite practicable to grade the fees, if no more than four classes were adopted. Assessed according to stand and accessibility, first-class limits could better afford a fee of \$300.00 than the lowest class could one of \$50.00. It would be neither a long nor a difficult task for a number of Government cruisers to make the rough estimates necessary to place limits in the different classes, and the information thus obtained would in other respects be of value to the government. The scales of fees could be fixed in advance for a certain period of years. Where logging is carried on, or in the case of damage by fire, the limit would naturally drop into a lower class.

ROYALTY TAX.

Inequalities implied in the present method of levying the royalty tax are:

1. Logs costing dollars to bring to the mill pay just as much as those costing only a few cents to deliver.

2. Logs making, for instance, a thousand feet of clear cedar finish pay no more than logs making a thousand feet of knotty hemlock boards.

3. In the seasons when his product fetches a low price the lumberman pays just as much as in good seasons.

Dr. Clark's proposal to assess the royalty tax as a percentage of the F.O.B. value of the mill product still retains the first named defect: it neglects altogether cost of transportation to the mill.

To totally eliminate the above named defects and to really equitably grade the royalty tax would be a difficult task, requiring the permanent services of a large number of reliable men. Instead of this it might in the meantime suffice to levy the tax as a percentage of the current average price of logs in defined districts.

As lumber prices go up measures must be taken towards insuring to the public treasury a corresponding benefit. The dues must be raised, and foresters are agreed that the safest

policy is to raise the royalty tax and not the license fee, but various local authorities object. They say that in many cases the license-holders do not themselves operate and that the purchasers of the stumpage pay the royalty tax. If the tax should be considerably raised it would appear to be necessary to devise a way of collecting it from the owner of the limits, for while his profits may become very large, those of the millman and the logger will probably not increase.

RESERVES.

The government in 1907 withdrew from the market the remaining timber areas of the province, but has as yet made no announcement as to their final disposition. As private individuals have so generally endeavored to obtain for future holding large tracts of timber, it is more than likely that it would be good business on the Government's part to follow the same policy; to announce definitely that suitable areas shall be permanently reserved. This step, always desirable, has been rendered absolutely necessary by the granting of extension of tenure and consequent shelving (as regards a great part of the province's timber) of the privilege of state ownership and direct control. To short-sighted people the timber of British Columbia may seem inexhaustible, nevertheless the time will come when not only the settler, the small millman and logger but many industries will depend for their prosperity solely on the measure of foresight shown to-day. Reserved from alienation but not from any legitimate future demand or use such areas, instead of "Reserves" might well be named "Provincial Forests." And why should any government hesitate when, for keeping itself in blessed memory, no more enduring monument could well be devised?

Directly administered by the Government, and thus a field for the practical work of trained foresters, the Provincial Forests would not only become a source of much-needed,

accurate information, but would show such silvicultural results as would lead to the firm establishment of scientific methods throughout the province. On the Dominion reserves the Forestry Branch of the Interior Department, with practical ends in view, has already in a very short time done such technical work as to greatly raise the status of forestry in Canada.

In the somewhat distant future the Provincial Forests can be made an effective weapon in case of any attempted monopoly in the logging business. As at present, however, only a small proportion of the unalienated areas is accessible, it would seem to be necessary to reserve the right to compel cutting on licensed limits, when in the Government's opinion the market is designedly short of logs. Extension of tenure and greater safety from fire will in any event make holders less eager to operate and render high prices for logs probable.

LOGGING REGULATIONS.

In the absence of adequate supervision it would appear to be necessary to draw up for large divisions of the province appropriate logging regulations. If there were a sufficient number of trained men in government employment general regulations would be unnecessary, as the forester could then decide on the spot how best to minimize fire danger, avoid destruction of young growth and encourage reproduction. As things are, certain plain regulations and restrictions, appropriate to the climate and conditions of large districts, will at any rate be a step forward, are likely to be generally observed by the lumberman and will be a help to the probably small number of officers appointed at first.

The matter is complicated by the fact that in British Columbia there is a greater diversity of climate and general conditions than in any other province. At the coast, the demand for the lower grades of lumber being

poor, there is much inferior, but still merchantable, timber left in the woods. In the upper country, on the other hand, where growth is much slower, there is a good demand from the prairie country for the low grades. And here, to prevent slaughter of immature stands, a diameter limit to cutting is very necessary. Greater care, too, is essential in the upper country with regard to logging operations. There is more danger from fire, natural reproduction is less satisfactory than on the coast, and a drier climate makes all the more important, for the general welfare, the preservation of a forest cover on the mountain sides.

As operators have so far been subject to no control whatever, restrictions will naturally at first prove irksome. However, there is no need, and there can be no desire, to have them made burdensome.

FIRE PROTECTION.

Better protection against the fire danger is simply a matter of a larger number of good men and closer organization. Reasonable safety depends on an efficient patrol with such hearty co-operation from settlers, prospectors, lumbermen and railways that not only will fewer fires be started, but that those started will be discovered and extinguished in their incipient stage. Perhaps it is hardly realized here yet, that efficiency lies, not so much in general preparedness to fight big fires, as in constant systematic patrol; for the big fire is always proof that the main usefulness of the patrol has not been attained.

The railways are probably the worst offenders and enforcement on them of less careless methods would mean a very great improvement in the whole situation. It would be a revelation to the majority in this country to see the dense population, the incessant railway traffic and, with it all, the absence of unsightly burnt areas, in such well timbered

countries as Germany, Austria and Switzerland.

Undoubtedly in this province a much keener interest is shown than formerly, and this general awakening to the importance of fire protection is the more gratifying as it promises that, as the many other questions of forest policy become known and understood, they too will receive the

attention due them.

The whole forest situation in British Columbia is at a most interesting and critical stage. In this article no more has been attempted than to throw a little fresh light on such points as were, through this Journal, lately brought into prominence.

CONSERVATION THE WATCHWORD.

Under the auspices of the Ontario Forest, Fish and Game Protective Association a meeting was held in the Convocation Hall of the University of Toronto on the evening of May 18th in which was strikingly brought out the fact that the preservation of the forest itself lay at the root of all efforts to conserve the fish, game, water-powers, the supply of pure water and the health of the community. The striking features of the meeting were the address of Hon. Clifford Sifton, Chairman of the Commission of Conservation, the suggestion of Dr. Byron E. Walker, that the Ontario Government should set aside a tract of timber land for practical work by the Faculty of Forestry of the University of Toronto, and the reply thereto and other important statements made by Hon. Frank Cochrane, Minister of Lands, Forests and Mines for Ontario.

The chair was occupied by Hon. Frank Cochrane, and on the platform, among others, were: Hon. Clifford Sifton; Dr. DuMoulin, Anglican Bishop of Niagara; Dr. Byron E. Walker, President of the Canadian Bank of Commerce; Sir William Mulock, Sir Mortimer Clark, Senator J. K. Kerr, Hon. J. J. Foy, Dr. B. E. Fernow, Hon. Thomas Crawford, President Falconer, of the University of Toronto; G. T. Blackstock, K.C.; A. Kelly Evans, Secretary of the Ontario Forest, Fish and Game Protective Association; W. F. Maclean, M.P.; Thomas Ritchie, Belleville, H. M. Mowat, K.C.; H. H. Dewart, K.C.; Rev. T. Crawford Brown, Col. W. H. Cotton and T. R. Whiteside, M.P.P.

HON. FRANK COCHRANE.

Hon. Mr. Cochrane, in introducing Hon. Mr. Sifton, declared that the conservation of resources would be of benefit not only to the coming generation, but also to the people of the present day. The Dominion Government should be given credit for appointing a commission which had so practical an object. Among its committees those on fish and game and public health could work well together, for in seeing to the interests of the anglers and sportsmen, the most healthful of occupations was being promoted. He felt that Ontario knew little of its resources, only one-fifth of its area being settled, while there were millions of acres where the white man was unknown. If it had been predicted some years ago that one township in Northern Ontario would bring forth products worth \$13,500,000 in a year, the statement would have been scoffed at. He added that it was the intention of Ontario to blaze the trail in provincial co-operation. "We have been taking stock," observed the Minister, "with a view to action. We are realizing that a strong and helpful policy may be evolved to grapple with our share of the conservation problem in conjunction with the promotion of public health. We propose, in the near future, to do something to dispel the erroneous theory that God made great tracts of our wild, unopened country only to hold the balance of it together."

HON. CLIFFORD SIFTON.

Hon. Mr. Sifton, who was received

with applause, said he was gratified to see so many leaders of public opinion present. Canadians had been living for some years in an age of exploitation or development, but unfortunately this exploitation was largely designed to benefit individuals, and the converting of national resources into stocks and bonds.

Never in the history of the world had natural resources been converted into money with so much energy and with such reckless disregard of the future as in the United States during the past forty years. Great districts had been suffered to become impoverished and others monopolized by large financial interests, but now a conservation movement had been launched there, a bitter controversy had resulted, because of the hostility of great financial interests, but in Canada, he was happy to say, such interests regarded conservation in a friendly way.

The movement was so wide in scope that its advocates were certain to make some mistakes, which were then magnified by enemies out of all proportion, but even in the United States the opinion of the most public-spirited men was in favor. Unless its principles were adopted in the near future there would be in the United States social disturbances in the nature of a national calamity.

Mr. Sifton hoped he would not be considered heretical if he expressed doubt whether the truly democratic form of government had made good. In the United States, which was the great example of such government, the great store of wealth was becoming monopolized by the few and the great mass of population was suffering from actual want. In view of the probable increase of population of from 25,000,000 to 30,000,000 in the next ten years and the rapid depletion of the fertility of the soil, the United States would realize in time that just as the poverty of the masses is the great problem in Britain, such a condition was rapidly coming about in the United States. One of the

greatest difficulties in Canada was to make the people realize their power to accomplish great results with comparative ease.

For years Canada's cry had been for population and capital to develop its resources. They were now pouring into Canada, and soon there would be an entire change in the national position.

"Enterprising capitalists of the United States are pressing upon us and reaching out to make use of our resources for their own purposes," he declared. "They will not come for a purely philanthropic purpose, but for their own financial advantage."

"The value of our resources is now appreciated by them. Every effort to seize upon them will begin. Capital, energy and business capacity will be freely employed to accomplish the desired end."

Canada stood on the threshold of a new national era. It was the duty of the country to get rid of the old shibboleths. Great national questions gave rise to political parties. To-day the greatest work was to arrive at a systematic plan to protect those things that were the means of subsistence of the population so that they could be made permanent assets, prevent their control by monopoly and allow them to inure to the public benefit for all time. If protective laws were framed Canada might safely welcome the incoming tide of population and capital.

Most of the conservation questions were co-related. The preservation of the forests affected the timber supply, climate, water-supply, water-power, fish and game—in fact, almost every natural resource.

Mr. Sifton sketched the history and work of the commission, pointing out that it was an advisory board and had no power to legislate.

"Thus they have very little power for evil," he commented. "They can only advise, and if their advice is not good, it need not be followed."

The committee on public health, of which E. B. Osler, M.P., was chairman, would meet on the following

Monday to consider the appointment of a medical officer to give expert advice.* The pollution of rivers and streams was a menace to public health and had given rise to great epidemics. The commission would recommend legislation that would do away with the evil. A plan for treating tuberculosis, to which the government would give assistance in a large way, would be prepared.

GROWTH OF FORESTRY.

Dealing with the development of interest in forestry, Mr. Sifton said that ten years ago, when he had suggested adding a Forestry Branch to the Department of the Interior, he had been informed that there was no one in Canada regarded as a trained forester, but since then there had been a great change. The name of Dr. B. E. Fernow had become a household word, declared the speaker, amid applause. Public opinion had been aroused regarding forestry and this was a great victory.

The destruction of forests in Canada by fire was absolutely appalling. Fire was the great enemy of the forest, and the most prolific cause was railway locomotives. The Commission of Conservation had recommended to the Dominion Government an amendment to the railway act requiring every railway company to maintain an efficient fire-fighting force along every mile of its lines, and placing the companies under a very heavy penalty for fires started by their locomotives. It was a pretty radical measure, but he was pleased to be able to tell them it had met with favor from the Government, and that they might expect the legislation at the next session of Parliament.

The Commission of Conservation had been created in the midst of an epidemic of water-power legislation. Its work had been made difficult because of political questions involved, but those who had watched the Commission would say that it had clubbed

friends and foes impartially wherever its principles were involved.

The proposition to dam the St. Lawrence meant the transference of nearly all the power to the United States side of the river, and the Commission had felt that it was in duty bound to pour in a broadside against it.

"Perhaps it is too much to say that the scheme is dead," he added, "but if it is not, it has received a severe paralytic stroke, and it is likely before long to be in extremis. If it ever did reappear the Commission desired the vigilant attention of the press and the public.

"What I want to impress," said Mr. Sifton, "is that the Commission is non-partisan, composed of men who are endeavoring systematically to influence legislation affecting the great natural resources of Canada along the right lines."

The speaker spoke warmly of the good results achieved by the Ontario Forest, Fish and Game Protective Association, a work which was little known or appreciated by the public as yet, but which in ten or fifteen years would show splendid results. He believed the association should be aided by the patronage of the Ontario Government.

The Commission had urged upon the Dominion Government the establishment of an immense forest reserve on the eastern slope of the Rocky Mountains. The reserve would be 400 miles in length, and from 50 to 150 miles wide. "It will be the greatest forest and game preserve in the world," said the speaker, "and will be national property for all time to come." He suggested that Ontario take some such action relative to the district between Sudbury and Port Arthur. In Ontario there was a fine example of what could be done in Algonquin Park. He had been informed by trappers some years ago that the beavers were almost extinct, but, under care, they had grown so numerous in Algonquin Park that they had to be killed.

* Dr. Chas. A. Hodgetts, Secretary of the Ontario Board of Health, was the choice of the Committee, which met on May 23rd last.

In conclusion, Mr. Sifton said that while the subject was comparatively new, it was one that appealed to public-spirited and educated men as a worthy one.

ONTARIO'S POLICY.

"We have now two such reserves," commented Hon. Mr. Cochrane, "and I am pleased to assure Mr. Sifton that before another year goes round the provincial government will probably adopt a policy under which each reserve as it is set apart will become likewise a fish and game preserve."

BISHOP DU MOULIN.

Right Rev. J. P. Du Moulin, Bishop of Niagara, said he had lived in Canada 48 years, and had travelled from Sydney to Esquimalt. Canadians had had given to them in trust a large, grand and most interesting country, and every patriotic Canadian ought to wish to see his country realize the full possibilities of its length and breadth. They should be better stewards of this inestimable trust. There were other contributors to the destruction of the forests by fire besides the railways—indiscreet picnickers and campers. There was only one thing to be done to realize the object for which the meeting was called, and that was to appeal to the sound sense and to the patriotism of the people to behave themselves well and to handle carefully their trust.

DR. BYRON E. WALKER.

Dr. Byron E. Walker, President of the Canadian Bank of Commerce, who is also Chairman of the Board of Governors of the University of Toronto, made a direct and telling speech. The importance of conservation was unquestionable, he said, but the trouble was in getting every man, woman and child to realize that it was not only an administrative and economic question, but also a great question of national morals and national character. He went on to say that the University of Toronto had offered to the Commission of Conservation the

use of its laboratories and other facilities that it might aid the Commission in its investigations in any possible way. He went on to urge upon the Minister of Lands and Forests (Hon. Mr. Cochrane) that the government should turn over to the University of Toronto a large area of timber-land in order that the Faculty of Forestry might try a practical experiment of turning that area into a dividend-producing perpetual forest, the results of which might go towards the cost of education in the province.

A DEMONSTRATION IN FORESTRY.

"It will not be hard to persuade the Government to act upon that suggestion," commented Hon. Mr. Cochrane promptly. "The subject is before them, and a practical and successful demonstration has been made of its possibilities by the forestry students of the Ontario Agricultural College."

Mr. Geo. T. Blackstock, K.C., moved the vote of thanks to Hon. Mr. Sifton, and Mr. A. Kelly Evans spoke on the need of still further efforts to arouse the public to the great interests at stake.

Mr. Evans drew attention to statistics showing revenue that the province derived from tourists alone who sought sport on Ontario streams. He believed that directly and indirectly \$5,000,000 had been attracted to the province last year by its game and fish. He also drew attention to the enormous and extravagant exportation of fish to the United States, and he questioned whether one of the first things the Commission of Conservation would have to consider was not whether it would be practical to prohibit entirely the exportation of fish to the United States.

Readers of the CANADIAN FORESTRY JOURNAL were grieved to hear of the death of Mr. Stanislas Gagne, a contributor to the issue for December, 1908. Mr. Gagne was engineer in charge of a construction party on the Ha Ha Bay Railway, a large number of whom were killed by the premature explosion of a charge of dynamite.

THE ROCKY MOUNTAIN FOREST RESERVE.

The entire eastern slope of the Rocky Mountains, from the International boundary northwards up to the middle of Township 61 west of the sixth Dominion meridian (longitude

provinces and other related objects. This is the effect of an Order-in-Council dated May 13th, 1910.

The total area of the district now reserved from settlement along the



Photo H. R. Macmillan

In the Rocky Mountain Forest Reserve. Mountains at head of Oil Creek, near summit of continental divide.

118 degrees west), is now reserved from settlement or occupation, and will be managed entirely with a view to the proper utilization and reproduction of the forest, the protection of the water supply of the prairie

eastern slope of the Rockies in Canada is about 14,400 square miles. This, however, includes Rocky Mountains Park (area, 4,500 square miles), Jasper Forest Park (area, 5,000 square miles) and the Waterton Lakes Park

(54 square miles in extent); these have been reserved for some time. The area now put under reserve for the first time is thus about 4,850 square miles (or 3,100,800 acres).

This entire area may, however, be looked upon as one reserve. Its area is thus over two-thirds that of Nova Scotia, over three-fourths that of the "southwestern peninsula" of Ontario (including under the term "southwestern peninsula" all counties west of, and including York and Simcoe, and enclosed by the Georgian Bay and Lakes Huron, Erie and Ontario), and over five and a half per cent. of the area of Alberta. Looking farther afield for a comparison of areas, one may say that the reserve is half the size of Maine, twice the size of New Jersey, one-third the size of the state of New York, or as large as Massachusetts, Connecticut and Rhode Island put together. Moreover, it is twice the size of Wales, half the size of Scotland and one-fourth the size of England and Wales combined.

The most northerly boundary of the Park is situated a short distance north of the 54th parallel of latitude and is some 360 miles north of the International boundary. The western boundary of the reserve is the boundary between the provinces of Alberta and British Columbia and the eastern boundary is an irregular line defined by the Order. The northerly limit is thus between forty and fifty miles north of the latitude of Edmonton and about a hundred miles northwest of Yellow Head Pass. The width of the strip set aside varies from ten to thirty miles from the International boundary up to the latitude of Calgary, and from there northward widens out to from 30 to 50 miles almost to the northern boundary. The boundaries of the reserve as actually constituted differ somewhat from those shown on the map of the proposed reserve as given in the report of the Commission of Conservation.

The lands included in the tract are for the most part elevated and rocky

and generally not suited for agriculture. They are however, covered to a large extent by a forest which is of great value for the supply of wood and lumber to the prairie country lying eastward from the base of the mountains, for the requirements of the coal mines and for the protection of the sources of the main streams of the central West.

On the additional 4,800 square miles just reserved the effect of the reservation will be to withdraw the lands from homestead entry or sale and the timber from disposal under license. The tract will still be open for the granting of timber permits to settlers, for mining purposes (for not more than one quarter-section), for cordwood, fence-posts, telegraph poles and railway ties and for small mills cutting timber for settlers only (for not more than one section for two years): also for mining leases for placer claims, for petroleum locations and for coal and other minerals, and also for permits to remove sand, gravel and stone from the submerged beds of rivers.

The regulations for forest reserves, under which the reserve is placed, forbid trespass, regulate the use of fire and prescribe proper precautions and penalties, require a permit for prospecting for minerals, prohibit grazing, except for settlers' cattle, provide for granting permits to cut hay and provide for careful cutting and the disposal of debris. Granting of leases for mining claims is subject to certain special provisions. Any person entering the reserve for the purpose of hunting or trapping must have a permit.

The reserve will be under the administration of the Forestry Branch of the Department of the Interior, and the far-seeing and progressive policy of the minister of that department, Hon. Frank Oliver, is a guarantee of the wise use of the reserve in the interest of the people of Canada.

The matter of forming such a reserve has been strongly urged at

different times by the Canadian Forestry Association, and it is gratifying to its members to know that the recommendations made by the Association have been adopted. The question of the reservation was discussed at considerable length by the Forests, Waterways and Waterpowers Committee of the House of Commons in the spring of 1909, when Mr. R. H. Campbell, Superintendent of For-

estry, gave much evidence in regard to it. In the committee's report it was strongly recommended that the reserve be created. Hon. Clifford Sifton, chairman of the committee and also chairman of the Commission of Conservation, has vigorously followed up the report of his committee, with the result that the much desired aim has been attained.

REGULATING THE GRAND RIVER.

Readers of the FORESTRY JOURNAL will remember an article by Mr. W. H. Breithaupt, M. Inst. C.E., of Berlin, Ont., entitled "River Regulation, with Special Reference to the Ontario Peninsula and to the Grand River," in which he advocated the inauguration of measures for the conserving of the flow of the Grand and other Ontario streams.

Organized effort looking to this end has now been undertaken by the Grand River Improvement Association, which has for president Mr. J. P. Jaffray, of Galt, and for vice-president Mr. Frank Cockshutt, of Brantford. Mr. J. H. Hancock, of Galt, is the secretary. In March last a deputation from the association waited on Hon. Dr. Reaume, Minister of Public Works for Ontario, for the purpose of urging their object. The deputation was headed by Hon. Clifford Sifton, chairman of the Conservation Commission, and included, besides the officers mentioned above, Messrs. F. S. Scott, Wm. Robinson, and James Webster, Galt; Mayor Wood, of Brantford; B. Zeaman and H. C. Edgar, Preston; it was accompanied by Messrs. J. H. Fisher, H. G. Lackner, M.D., Geo. Pattinson, J. J. Craig, and W. S. Brewster, M.P.P.'s, respectively, for North Brant, North Waterloo, South Waterloo, East Wellington and South Brant (constituencies which are chiefly interested in the proposed work). The deputation was given a sympathetic hearing.

The city of Brantford has been the

greatest sufferer from the freshets of the river, and has expended the sum of \$160,000 in its endeavours to prevent such damage. By far the greater part of the city, of course, is not at all affected by the floods, the area so affected being not more than ten per cent. of the total area of the city.

This area has been protected by a series of dykes which have been extended from time to time until they are now two and three quarter ($2\frac{3}{4}$) miles in length, running along the bank of the river at an elevation of about three feet above the extreme flood level. To quite an extent the material from which the dykes are built has been obtained from the bed of the river, the channel thus being deepened at the same time. The width of the top varies from four to six feet and the slope of the sides is usually $1\frac{1}{2}$ to 1 on the land and 2 to 1 on the river side. In portions of the river subject to the action of the current the bank has been protected by a series of timber cribs and in other places rip-rapped with stone.

The main river channel at the city bridge has been widened 100 feet, a new span added to the bridge and a sluiceway dam, having openings 100 feet in width has been added to the main dam across the river. The height of the water at flood time can be regulated at flood time.

Mr. Breithaupt has kindly supplied the JOURNAL with information to supplement that published in the



The Grand in Freshet Time. Scene at T. H. & B. Railway Station, Brantford, April 2nd, 1900.

Photo Park & Co., Brantford



Bridge and Sluiceway Dam on Grand River, Brantford.

Photo Park & Co., Brantford

article above referred to. He writes as follows:

"The length of the Grand River, along its windings, from its source in Melancthon Township to its outlet into Lake Erie, below Dunnville, is about 160 miles. Its general course is south. Its tributaries, in their order from up stream, are the Conestogo from the west, the Speed-Eramosa from the east, and the Nith from the west.

Good possibility for storage on a large scale exists on the main river in the deep and narrow valley below Elora, and above Fergus, as well as at sites further down; and the Nith appears to offer excellent facilities for storage.

"With storage capacity of two and one-half to three billion cubic feet increase of low water flow to the extent of 350 or 400 cubic feet per second could be effected. This would at once double the minimum-flow horse-power of the present water-power developments on the lower river, and give effective flood control by enabling catchment of the destructive part of the high-water flow.

With such minimum flow numerous other water powers, now of no value, could be developed along the upper river.

"Restoration of the original condition of the head-water plateau would require consideration of an area of at least 400 square miles to have any material effect. While this would involve great cost it is open to question whether, in view of the magnitude of the interests involved, it would not prove economical in the end. Another method of regulation is by storage.

"The water powers on the Grand River are very considerable. With the dwindling of low water flow some of them have become practically useless and those still in use are greatly impaired. These latter are on what may be called the lower river from Galt downwards. The heads of water made use of are:

"Galt, 8½ ft.

"Paris, 14 ft.

"Brantford (two developments), 16 ft. and 32 ft.

"Caledonia, 7 ft.

"Dunnville, 6 ft.

REFORESTATION IN NORTHUMBERLAND AND DURHAM.

In February last representatives of the united counties of Northumberland and Durham, Ont., waited on the Ontario Government in reference to reforestation of the fifteen thousand acres of sand-lands in those counties. What the deputation asked for was that the Government advance the money necessary to purchase and reforest the lands, and do the work of re-planting under their own officers. The united counties would pay the government the interest on the money so expended, and as soon as the timber had reached marketable dimensions the yearly growth would be sold and the government reimbursed. The counties would then have the profit after the government was repaid.

The deputation was received by Hon. James Duff, Minister of Agriculture, and Hon. Frank Cochrane, Minister of Crown Lands, and was given an unusually lengthy interview. The deputation was introduced by Mr. J. H. Devitt, M.L.A., of Blackstock. The speakers included Warden A. L. Boyce, of Dartford, ex-Warden A. A. Powers, of Orono, and Reeve A. A. Colwill, of New-

castle, who presented the case for the deputation. Others who spoke included Messrs. C. J. Thornton, of Kirby; S. Clark, M.L.A., of Cobourg; S. Nesbitt, M.L.A., of Brighton, and J. J. Preston, M.L.A., of Bethany.

The other members of the deputation were Messrs. Alex. Weatherson, Warkworth; Joseph Hickson, Mount Horeb; Charles Sherwin, Roseneath; Alex. Wight, Bowmanville; R. Caldwell, Osaca; James Byers, Blackstock; Daniel McColl, Wooler; Herbert Rosevear, Port Hope.

Mr. Colwill stated that the deputation believed that the project was thoroughly feasible and a safe financial undertaking. This led Hon. Mr. Cochrane to ask why the Counties' Council was not willing to finance it itself. Hon. Mr. Duff stated that the members of the York County Council had asked for power to purchase waste land in order that they might re-forest and control such land themselves. The York County Council did not expect any financial assistance from the government other than

possibly, the giving of a few trees for re-forestation purposes.

Mr. Colwill replied that in the case of Northumberland and Durham the project was too big a one for the Counties' Council. He pointed out that the work could only be undertaken to the best advantage by a bureau of forestry which would have a continuity of purpose impossible with the average county council. He contended also, that the government was in a better position to obtain the money required, at reasonable rates than was a small municipal body.

Ex-Warden Powers presented the case clearly and forcibly for the Counties' Council, having given it a great deal of attention and study. He stated that the method of re-forestation was one that had commended itself to the Counties' Council after careful and thorough consideration on several occasions. The proposal had been discussed at local meetings held throughout the united counties and had been everywhere endorsed. It was one which had

been endorsed as thoroughly practical and feasible by Dr. Fernow, Dean of the Faculty of Forestry in Toronto University. Public sentiment in the united counties, he had been informed by Prof. E. J. Zavitz, of the Ontario Agricultural College, Guelph, was more advanced on the forestry question than anywhere else in the province except, possibly, in Norfolk County, where the government had a reserve. He expected, therefore, that the government would give Northumberland and Durham the first consideration when dealing with this forestry question.

Both Mr. Thornton and Mr. Colwill gave evidence that the land was suitable for the growing of splendid pine. Mr. Thornton claimed that trees, if given proper care, would make splendid growth within 30 years.

Hon. Mr. Duff, on behalf of the Government, expressed their realization of the importance of the matter and promised careful consideration of the proposal.

SOME FOREST FIRES OF 1910.

The unusually dry season has made the spring of 1910 a specially bad time for forest and prairie fires in the western provinces.

Towards the end of April a fire occurred at the head of Willow and Trout Creeks, in the Porcupine Hills, Alta., which burned over approximately 140 square miles, which was largely covered by young timber and some small areas of mature timber, the loss amounting to two and a half to three million feet of timber. Some notoriety was given to the fire by an interview which appeared in a western paper to the effect that the fire rangers were not doing their duty, as their pay did not begin until May 7th. The person interviewed subsequently, when challenged, declared this part of the report erroneous. As a matter of fact, the rangers were hard at work all the time, and had been on duty for the greater part of April. The only damage done to personal property by the fire was the destruction of one haystack. The settler from whose land the fire started was subsequently prosecuted and FINED THE SUM OF \$10.!!

Fires were also reported from the vicinity of the Riding Mountain Forest Reserve, and in the district north of Prince Albert.

During the last week of May a bad fire raged in the country traversed by the C. N. R. Prince Albert Branch some seventy miles west of the Saskatchewan-Manitoba boundary. At Mistatim the Cowan Construction Co.'s camps and sawmill were destroyed on the afternoon of May 28th, together with 17 C. N. R.

freight cars, some buildings and a quantity of lumber. The Cowan Construction Co. will, it is reported, rebuild their mill, with a view of utilizing the burned timber immediately. About a hundred and fifty square miles of timber have been fire-swept. Traffic on the railway was stopped for about a day. The fires were finally extinguished by heavy rains. The Great West Lumber Co., of Greenbush, Man., lost seventy-five thousand logs, which were burned on the bank of a tributary of the Red Deer River. The fire burned along the railway on both sides, extending back from two to two and a half miles. It would seem that the C. N. R. Co. and the Cowan Construction Co. are themselves largely to blame for their loss. The C. N. R. Co. undertook to clean up their right-of-way in the spring, and, indeed, informed the Superintendent of Forestry that this had been done, when, in fact, scarcely anything had been done. The Cowan Construction Co. also failed to obey the instructions of the Department to clean up the debris around the mill. Chief Ranger Davis, of Dauphin, Man., was in charge of the 150 men who were fighting the fire. The damage is variously estimated at from half a million to a million dollars.

Mr. J. K. Cornwall, member of the Alberta Legislature for Peace River, reports that large forest fires have been raging in the country around Lesser Slave Lake. He estimates the amount of damage at half a million dollars. A severe wind storm early in May blew down much of the damaged timber.

A number of fires occurred in and near the Riding Mountain Forest Reserve which kept the rangers busy, but, as far as is certainly known, little damage seems to have been done.

A very serious forest fire occurred about the middle of June a short distance west of Port Arthur, the chief damage being done in Connee, O'Connor and Paipoonge townships. The damage to standing timber is said by the despatches to amount to hundreds of thousands of dollars, and many settlers have lost all they owned. Several persons were reported to have perished, but all these have been found to have escaped.

Extensive fires are reported from North Minnesota, Northern Wisconsin and Upper Michigan. Near Grand Marais, Minn., many settlers were burned out. The towns of Bemidji and Walker, Minn., (near the latter of which is the State Tuberculosis

Hospital) were threatened, but the fires were checked by rain.

Instances such as many of those given show, not only the need of more efficient legislation on the subject, but also, and in a far greater degree, the necessity of rousing public interest to the problem presented by the forest fires. Not only should railways be warned about the danger from locomotive sparks, the leaving of debris on their right-of-way and other offences, but power should be conferred of penalizing them for neglect of such warnings. Evidently the intelligence of some western magistrates needs to be appealed to, also, so that, when there is brought before them a culprit responsible for the setting of a fire causing the destruction of millions of dollars worth of timber, he will not get off with a mere "flea-bite" of a fine such as that imposed on the Porcupine Hills offender.

WATERWORKS PLANTING.

To the city of Guelph, Ont., belongs the credit of being the pioneer in Canada in one line of forestry work, namely, the planting of waterworks catchment areas with forest trees.

The city leads Canadian municipalities as regards municipal ownership, owning and operating, as it does, its waterworks system, gas and electric light and power plant, street railway and sewerage systems, and owning also some sixteen miles of railway which is now operated as part of the Guelph and Goderich branch of the C.P.R.

The waterworks system (established some thirty-two years ago) is in the hands of a commission of three elected members, namely, Messrs. G. B. Ryan, R. L. Torrance, and Geo. Hastings, Mayor of the city, with Mr. J. J. Hackney as manager.

A short time ago the commission found that their source of supply (springs situated near the River Speed, which at times of need served as an auxiliary source of supply, just within the city limits) had become insufficient to supply the increasing needs of the city. After investigating the problem, they acquired, about a year ago, some 168 acres of land near the village of Arkell and about four and a half miles from the city. On this land were situated springs from which the water runs by gravity to the city.

Of the 168 acres about one-fourth to one-third is already forested, the growth being chiefly white cedar, with scattering balsam, fir and a few white pine. The trees grow chiefly on low land along the river. The soil is gravelly loam to clay.

The trees were planted at a distance about five feet apart each way, about 1742 trees being thus required to the acre.

About forty thousand trees were used, distributed according to species as follows:—White Pine, 15,000; Norway Spruce, 10,000; Scotch Pine, 10,000, and Larch, 5,000. The white pine used was material grown on the provincial government's seed-beds.

The total area planted was between 25 and 30 acres. So far the trees seem to be doing well.

The primary purpose of the planting is to protect the catchment area of the waterworks. In time some features of park management may be introduced, and possibly some income may in future be derived from the plantation.

The estimated cost per acre is as follows:
1,742 trees at \$3 per thousand. . . \$5.23
Cost of labor, etc. 8.00

Total cost of planting. \$13.23

No account is taken of the rental value of the land or of interest on the cost. The land, if not applied to forestry purposes, would, of course, simply lie idle.

The planting has been done under the supervision of Mr. E. J. Zavitz, of the Ontario Agricultural College, to whom belongs much of the credit in connection with the inauguration of the enterprise.

The cities of Woodstock, Ont., and Brantford, Ont., are also said to be contemplating similar planting, and will in time, no doubt, follow the lead of the Royal City.

Mr. E. J. Zavitz and Mr. J. Lawler addressed the County Council of Simcoe County, Ontario, at its closing session, on June 11th, on the problem of reforesting the 60,000 acres of waste lands in that county.

SWISS FORESTRY.

Switzerland recognized the benefits of forest protection and development 600 years ago when the forest ordinance of Bern was issued. The Sihlwald of Zurich, one of the most perfectly managed and most profitable forests in the world, has been handled under a working plan since 1680. The little Alpine republic still reports progress in forest work, and the United States consul writing from St. Gall says:—

"The government of Switzerland has so carefully regulated the timber output that it has never been permitted to exceed the natural growth. The thick growth of timber on the mountain sides, purposely allowed to become dense, has perceptibly lessened the danger and frequency of avalanches and landslides, which in former times were so frightfully destructive. To control the spring floods in the rivers and streams, massive dams, fortified by thickly planted trees, have been erected at exposed places. In the extraordinary attention paid to its timber lands, the government has taken into account also the necessity for sheltering and pasturing cattle, the maintenance of the soil, the roads, and the natural springs, climate, and the control of mountain streams.

"The actual forest area of Switzerland comprises 2,205,508 acres, 21.48 per cent. of the entire surface of the country, 77,004 of which belong to the state and 2,128,504 to the cantons, communes, municipalities, and private corporations. Seven hundred and eighty-one acres of the state forest are set aside as a nursery. From this nursery in 1908 over 22,000,000 young trees were taken and transplanted in the various forests.

"Swiss forests are classed as 'protected' and 'non-protected.' The former are those which are situated on mountain slopes where the imminence of washouts, stone and ice chutes, landslides and avalanches calls for the constant exercise of extraordinary care and attention. The 'non-protected' are those on comparatively level ground requiring only ordinary attention to keep them in good condition. Because of the character of the country, the great majority of the forests are 'protected.'

"The law provides that 'the forest area shall not be diminished' and that all forests shall be maintained in a fairly dense condition. Even in private forests close cutting or clearing up is strictly forbidden, especially in exposed places without the consent of the federal authorities, and then only in small areas and when prompt reforesta-

tion is guaranteed. Trees for cutting are carefully selected by forestry experts.

"Through the forests there are excellent roads, made largely by the cantonal authorities. The year 1908 was marked by such activity in road construction that the state, which bears a proportion of the expense, paid to the cantons the sum of \$46,634.00 on their account alone.

"Spruce is the most important tree in the Swiss forests, and then in order of their importance come the white fir, beech, larch, pine, cypress and a few other varieties.

"It is not to be presumed that the revenue from the entire Swiss forest area can be approximated by taking as a basis the earnings of the St. Gall or Winterthur forests, which have been for many years under most intelligent and excellent management, but the universal opinion among forestry officials is that the jealous care with which the Swiss timber lands have been guarded has vastly benefited both national and cantonal treasuries from the financial point of view."

"The principal revenue derived from the Swiss forests is from the lumber output, there being no manufactures of resin, turpentine, and similar by-products. To offset the cutting, there were planted in 1908 23,096,225 trees, of which 18,031,590 were conifer and 5,064,635 deciduous, and no less than seven tons of seed were sown.

"Statistics of the receipts and expenditures of all forestry work in the country are not available, but a couple of cases may be cited which show gratifying returns. The total receipts from the sale of wood in 1908 from 2,421 acres of state forests in the canton of St. Gall are given as \$24,457.37 and the expenditures as \$7,104.81, leaving a clear profit of \$17,352.56 (an average of \$7.17 per acre). In the forests of the town of Winterthur, amounting to 2,833 acres, the receipts were \$51,174.63 and the expenses \$21,634.50, leaving a net profit of \$29,540.13, or an average profit of about \$10.42 per acre.

MUNICIPAL TREE-PLANTING IN THE WEST.

The prairie city of Saskatoon, Sask., will plant six or seven thousand trees on its streets this year. The work is under the direction of the Park Commissioners. The town of Indian Head, Sask., is also carrying on a tree-planting campaign.

CARE OF ORNAMENTAL TREES.

The Care of Trees in Lawn, Street and Park. By Dr. B. E. Fernow, Dean of the Faculty of Forestry, University of Toronto. Henry Holt & Company, New York. Price, \$2.00 net.

To use the trite phrase, this book "fills a long-felt want," viz., the need of some "satisfactory, comprehensive treatment of the subject for amateur planters of trees."

To few (perhaps to no other) has it been granted to have so prominent a part in the introduction of forestry to an entire continent, and in this regard the author occupies a position that is quite unique. It is scarcely surprising that Dr. Fernow, who avowedly a forester, and as such interested in growing trees from a utilitarian standpoint, should have acquired a fund of information regarding the growing and care of trees from the æsthetic standpoint, information which it is the purpose of this work to pass on to others. Besides his experience in the care of parks (notably as a member of the commission on the reconstruction of Central Park, New York), the writer has not hesitated to make use of many bulletins bearing on this subject and other literature such as Count des Cars' work on "Tree Pruning"—aid which is freely acknowledged.

The book opens with a short introductory chapter, after which a chapter is devoted to the "Characteristics, Structure and Life of Trees," written in a style that makes it exceedingly interesting to any tree-lover. The science of tree growth is outlined in such a way as to relate the various parts of the subject to practical considerations. We are told, for instance, of the need of the tree, roots as well as crown, for air and the injury and, in some cases, death of the tree when deprived of it, the tree's need for light and the relation of this fact to the proper placing of trees, and other causes and consequences.

The diseases of trees are then taken up, and the different kinds of fungi, their mode of entrance into the tree, and their char-

acteristic damages are discussed, also the classes of insects that attack trees and their classification. A chapter on the recognition of the source of damage to the tree (diagnosis) follows, giving instruction how to recognize, not only the consequences of insect and fungus attack, but also the effect of "physiological diseases," induced by malnutrition or other unfavorable conditions, such as the presence of poisonous gas near the roots (which often happens in cities where gas mains have become leaky).

The control of these "physiological diseases" and treatment of mechanical injuries is taken up and considerable attention given to the matter of pruning. The control of fungus parasites and injurious insects is then discussed.

Care in planting and transplanting trees is given special attention; "transplanting a tree from one site to another is a surgical operation during which the patient needs special attention" the author remarks. A brief chapter follows on "Esthetic Forestry or Woodland Park Management."

A large part of the book is devoted to the consideration of the choice of plant material, and lists of trees desirable for shade and ornament, and of shrubs and plant material for special purposes are given at length.

The book is illustrated with several full-page illustrations and a hundred illustrations in the text, and the mechanical part of the work is worthy of the publishers. The dedication of the work to Dr. Wm. Saunders, Director of Dominion Experimental Farms, is a well-merited honor and will approve itself to members of the Canadian Forestry Association, of which he has been a director from the first, and to Canadians generally.

The volume will be a welcome and valued addition to the library of any owner and lover of trees and the name of the author is a guarantee of the soundness of treatment of the subject.

WASTE LAND PLANTING IN EUROPE.

In parts of Canada the problem of putting to the most profitable use lands that are now lying waste is coming prominently into view. Such a case is that of sand land planting in Ontario, where a good start has been made through the efforts of Mr. E. J. Zavitz, Forester to the provincial Department of Agriculture.

In this connection it is interesting to note what has been done along this line in European countries where the problem has long been studied. Not only

has much been done on that continent in planting cut-over lands, but the problem of establishing a forest cover on dunes and other waste lands—in short, on all land which has a greater value for producing timber than for other purposes—has been vigorously and persistently attacked.

France has been one of the foremost European countries in reforestation, especially in the mountains, where planting has been a powerful factor in controlling torrents and regulating

streamflow. The State each year buys uncultivated lands in the mountain regions, and up to January, 1907, it had acquired 503,000 acres in this way. Communes, associations, and private individuals are also assisted in reforestation work by grants of money, and be supplies of plants and seeds. Altogether 249,000 acres have been planted through this public assistance. Complete exemption from taxation for a long period of years is granted in case of plantations made on the tops and slopes of mountains. A reduction of three-fourths for all land planted or sown, whatever its situation, is also made.

One of the most striking examples of the results of planting waste lands is furnished by the reforestation of the "Karst" in Austria. The Karst was a stretch of barren lime-stone lands comprising some 600,000 acres in the hilly country along the Austrian shores of the Adriatic Sea. For centuries it had furnished the shiptimber and other wood supplies of Venice, but excessive cutting, together with burning and pasturing, had left it a waste almost beyond recovery. In 1865, the government began to offer help to land owners who would undertake forest planting there. Taxes were remitted for periods of years, technical advice was given, and plant material as well as money were supplied.

At present over 400,000 acres, or two-thirds of the Karst are under forest, partly as a result of planting, at a cost of eight or ten dollars an acre, and partly as a result of protection which made natural recuperation possible. In 1884, Austria also passed a reforestation law to control torrents. This law carries an annual appropriation of \$100,000, and extensive planting work has been successfully carried out under it.

Germany as a whole does not have so much waste land which it is necessary to plant. The Germans have been practicing forestry for so long a time that the greater part of the available land is already covered with forests. Some work, however, is done along this line. During the six years from 1901 to 1906 about 300,000 acres of land suitable for forestry were acquired in Prussia, although a part of this was already wooded. All possible assistance is also given to communes and private owners in planting work, and in 1908, \$110,000 was appropriated for this purpose. Baden endeavors to encourage forest planting by providing that all private waste lands, pastures, fields, and uplands planted with timber, remain free from taxation for a period of twenty years from the beginning of the first year of planting.

In Denmark no fixed appropriation is made for acquiring waste lands, but in the last twenty-five years over 43,000 acres have been purchased, and recently the annual cost for planting has amounted to over \$15,000. Tree planting on the dunes along the coast of Jutland for the purpose of protection from drifting sand is continuously going on. In addition to the work which the State is doing, annual grants are made to the Danish Heath Society, the special object of which is to encourage tree planting in Jutland. That the work pays is shown by the fact that during the last ten years the average annual profit from all State forest lands has been nearly \$100,000.

Other European countries are constantly doing similar planting work. Switzerland, for example, creates protection forests wherever possible by planting, and whenever forests are converted into farming and pasture lands an equal area may be ordered reforested. The great empire of Russia likewise spends large sums annually in planting. Belgium and little Holland are also active in making their waste lands productive through forest planting.

Putting every acre of land to its best use is the idea about which the whole policy of the conservation of natural resources revolves, and in the future the planting up of waste tracts in Canada and the United States is sure to be carried on extensively by private owners as well as by federal, provincial and state authorities.

EARL GREY It is expected that in the
GOES autumn His Excellency the
NORTH. Governor-General will make
a trip from Norway House,
at the head of Lake Winnipeg, to Port
Nelson (probably via the Hayes River),
thence by steamer to Fort Churchill, and
through Hudson Strait down the Labrador
coast to St. John's, Nfld. He may be ac-
companied by Sir E-n st H. Shackleton,
the Antarctic explorer.

THE HAND Portions of Algonquin
OF THE Park are now being lumbered
SPOILER. ed over for the hardwood
and some species of coniferous
timber left on them by former licencees.
Negotiations between the Provincial author-
ities and the licencees were fruitless, and
the licencees, whose right to cut was given
by statute in 1900, are proceeding with
the cutting.

Mr. R. H. Campbell, Superintendent of
Forestry, spent the months of May and
June in the West.

TO PREVENT FIRES ALONG RAILWAYS.

The Forestry Committee of the Commission of Conservation at its meeting on May 2nd last considered the question of the prevention of fires set by railways, and the following recommendations were made:—

“That to the provisions of the railway act already on the statute books relating to fires, the following clauses be added:

“For each and every case in which a fire is started by sparks from a railway locomotive, and either begins outside of the right of way or spreads therefrom to the adjoining land, the company which is operating the railway at the time when the fire is started, as aforesaid, shall be liable to a fine of one thousand dollars, to be recovered by summary prosecution before a stipendiary Magistrate or two Justices of the Peace;

“Provided, that it shall be a sufficient defence against any such prosecution if it be shown by the railway company:

“(1) That the company has used upon the locomotive the best available modern appliances for the purpose of preventing sparks spreading therefrom;

“(2) That no negligence has been shown

by the engineer or fireman of the locomotive, or any other servant of the company, conducing to the starting or spreading of the fires; and

“(3) That the company has maintained an efficient staff of fire-rangers properly equipped with all suitable appliances for fighting fires and proper and efficient means of travelling from place to place along the line of railway, and that the said staff has been prompt and diligent in taking all possible means to prevent the fire from spreading.

“The committee further recommends that the act respecting Government railways be amended to provide (1) that the Government railways maintain an efficient staff of fire-rangers properly equipped with all suitable appliances for fighting fires and proper and efficient means of travelling from place to place along the line of railways; and (2) that the Government railways shall provide free transportation for all provincial fire guardians properly certified as such, while travelling in the discharge of their official duties.”

EFFECT OF EXCESSIVE DEFORESTATION.

“What has been the effect of the tremendous consumption of timber upon our forests?” This question is often asked by people in various sections of the country, and often the information of the average man on the subject is not definite enough to enable him to make a clear and satisfactory answer. R. S. Kellogg, assistant forester, engaged upon statistics in the United States Forest Service, in giving a concise answer to the important question says:—

“Now our annual requirements exceed 40,000,000,000 feet of timber, 100,000,000 cross-ties, 4,000,000 cords of pulp wood, besides great quantities of other forms of forest products, such as firewood, posts, poles, mine timber, etc. The per capita consumption of lumber in the United States was 215 board feet in 1850; now it is 470 board feet.

“One forested region after another has been attacked. With the exception of Maine, the New England States are cutting mostly second or third growth timber. The box factories there take white pine saplings down to 6 inches in diameter. The so-called ‘inexhaustible’ white pine forests of Michigan are gone, and millions of acres of cut-over and burned-over land have gone upon the delinquent tax list. Michigan supplied 23 per cent. of the lumber production of the United States in 1880, and less than 5 per cent. of it in

1907.

“The value of the lumber production in Michigan since 1849 has been 50 per cent. greater than the output of gold in California, and it has all taken place without a thought for the future. The cream of our hardwood is gone, and it is becoming more and more difficult to get in sufficient quantity the high grades of oak, yellow poplar, ash and hickory that our great manufacturing industries require. The South’s once great supply of yellow pine is rapidly giving way before axe and saw, fire and tornado. Half a generation more will, in most places, see little but remnants left of the Southern forests, and in that time the Pacific Coast supplies will be heavily drawn upon.

“Ours is primarily a wood-using civilization. Despite the introduction of substitutes for wood in the form of stone, cement, concrete and steel, our consumption of timber has constantly increased from the earliest days up to the present time. The prices of forest products have risen more rapidly than those of other commodities. According to the reports of the Bureau of Labor, the quoted prices of the leading kinds of lumber on the New York market have risen twice as much in the last ten years as the average increase in all commodities. This indicates that the supply of timber is not keeping pace with the demand.”

SECRETARY LAWLER'S LECTURES.

Since returning from the New Brunswick Convention the Secretary has been chiefly occupied with office work, but he has delivered lectures before the Public School Principals' Association of Toronto, and also the senior pupils of the Ryerson, King Edward and Queen Victoria Schools of Toronto, from 200 to 250 pupils and 10 to 12 teachers being present on each occasion. On April 22nd he went to Newmarket, Ont. On the way he stopped at Aurora and spoke briefly to the pupils of the High School.

At Newmarket the lecture was held in the Town Hall. The chair was occupied by Hon. E. J. Davis, ex-Minister of Crown Lands for Ontario, who has given a great deal of attention to the subject of forestry. Among those present were Principal Firth, of Pickering (Society of Friends) College, and a number of the students, and Mr. E. A. Bogart, of the staff of the Bank of Montreal, who is an enthusiastic horticulturist and believer in forestry. At the conclusion a vote of thanks was moved by Mr. J. D. McKay, editor of the Express-Herald, and seconded by Mr. H. S. Cane, of the William Cane & Sons Company, Ltd., manufacturers of woodenware.

It was pointed out that even in York County, which is generally supposed to be wholly arable, there were stretches of sand lands which are now in danger of becoming waste. In some instances these farms have been practically abandoned. The particular district referred to lies about thirty-five miles north-east of Toronto in the township of East Gwillimbury.

On the following day the Secretary visited the garden of Mr. Bogart, where he is growing a number of conifers, particularly junipers. He then went through the factory of the William Cane & Sons Company, and saw the processes of manufacturing pails, tubs and woodenware.

The Secretary was also shown over the line of the Newmarket Canal where there is a stretch of four miles of public land between Newmarket and Holland Landing which could readily be made into a demonstration forest either by the Dominion or Provincial Governments. The main line of the Grand Trunk between Toronto and North Bay runs along this strip for the whole distance so that a forest there would be seen by thousands of people every month.

FORESTRY STUDENTS IN THE FIELD.

The practice-work of the students of the Faculty of Forestry of the University of Toronto was carried on this year on the limits of the Georgian Bay Lumber Company in the Townships of Wood and Baxter in the district of Muskoka, Ontario. The camp was on Nine Mile Lake, three miles south of Bala, which is one of the tourists' points of Muskoka. It was thus unusually easy of access, and in fact the flag station called Nine Mile siding was within 200 yards of the camp. The professors and students were lodged in the camp of the lumber company which was vacated by the men starting on the "drive" just as the camp began.

Dr. Fernow, Dean of the Faculty, Mr. A. H. D. Ross, Dr. C. D. Howe, Mr. J. H. White and about twenty students left for the camp on April 22nd, and, after completing the course, returned to Toronto on Saturday, May 14th.

The location was well suited in many respects for the purpose of a foresters' camp; it was on a stand of pure white pine, and the country is thoroughly characteristic of the Laurentian Plateau of northern Ontario. The limit is fifty square miles in extent, and has been lumbered on for some years, so that there was good opportunity for studying the effect of cutting and the possibility of new growth. The territory appears to be a succession of rocky ridges running from northwest to southeast

between which are to be found swamps' muskegs and small lakes.

The work of studying trees and tree types, surveying and the various methods of estimating the amount of timber to the square mile was thoroughly entered upon by the students. A number of test trees were felled by the boys to give them a standard by which to fix their estimates of volume. The felling, barking, and scaling of these logs gave them very practical experience in the woodsmen's art. Later on maps were made of the locality, showing the stand of timber and indicating the best places for logging roads.

This is easily stated, but, as the Secretary of the Canadian Forestry Association found from a few days' experience, it is really very strenuous work. The students breakfasted at 6.30 and were in the woods by 7 o'clock or 7.15. They carried their lunch and did not get back to camp until 6 p.m. Wet feet were the rule, and very often the boys in their enthusiasm and determination to run their lines straight through in spite of obstacles, waded waist-deep in the swamps. This, with the labor of scaling or sliding down precipitous rocks and repeated pacings to make sure of the size of areas, and with the occasional diversion of stopping to kill a rattlesnake, made up a full day that caused them to be ready for supper at night. People who have any idea that forestry is a nice, soft "snap" for

delicate young men need only a few hours in such a camp to change their theories completely. Then after supper the men usually put in a couple of hours of hard work in checking up the results of the day's work and in studying.

Dr. Fernow was well pleased with the solid work done by the students and with their enthusiasm and close attention to the rules of the camp.

Probably because of their hard work in the open air every day, the health of the boys in the camp was excellent, and a brown and husky set of young men returned to Toronto to take up their work with the various parties for the summer.

Of the forty students this year in attendance at the Faculty of Forestry of the University of Toronto, thirty-two are known to be engaged as follows through the summer: With the Dominion Forestry

Branch, 12; the Canadian Pacific Railway, 9; the Pennsylvania Railway Co., 2; Nova Scotia Forest Survey, 3; Turner Lumber Co., 1; fire ranging, mostly in Ontario, 5.

It is interesting to note the presence of so many mature men in attendance in the classes, showing the good material that the school has to work with. The average age of the students attending all the classes was 22.4-10 years. This has had an excellent effect upon the discipline and amount of work accomplished through the past academic year.

The figures for the students of the University of New Brunswick were not in when this article was prepared, but a private letter of some time ago indicated that two of them would be in British Columbia, one in Alberta and one on the limits of the Laurentide Paper Co. in Quebec under Mr. Ellwood Wilson.

NOTES.

NOVA SCOTIA SURVEY. Under the direction of Dr. Fernow, Dean of the Faculty of Forestry of the University of Toronto, the reconnaissance forest survey of Nova Scotia is being completed this summer. Those engaged in the survey are Dr. C. D. Howe and Mr. J. H. White, lecturers in forestry in the University of Toronto, and the following students: Mr. T. W. Dwight, of Guelph; Mr. Alain Joly de Lotbiniere, of Point Platon, Que. and Mr. Wm. Kynoch, of Toronto.

WORKING IN BRITISH COLUMBIA. Mr. A. H. D. Ross, M.A., M.F., lecturer in forestry in the University of Toronto, is at work in British Columbia, and several of the students are under his direction. Of the senior students Mr. G. H. Edgecombe, of St. John, N.B., is at work in the reserve on the eastern slope of the Rockies, Mr. P. I. Bryce, of Ottawa, and Mr. L. N. Ellis, of Toronto, are in the Prairie Provinces.

REMOVING TO OTTAWA. It is expected that by the time this number of the **CANADIAN FORESTRY JOURNAL** is issued the Secretary will have moved to Ottawa where his headquarters will be the Canadian Building, Slater St. Correspondence should be sent to him at the new address. This change has been in contemplation for some time past and it is expected the bringing of the executive officers together will greatly facilitate the work. At the same time it is hoped that the Secretary will be able to keep in close touch with Dr. Fernow and his staff in the Faculty of Forestry in the University of Toronto, from whom so much assistance

has been received, particularly during the past year. When it was decided to appoint a permanent secretary, Dr. Fernow granted the Association the free use of a room for office purposes in the Forestry Building. This has been the least of the benefits received by the Association from this connection, as the Secretary has also had the use of lantern slides for his lecture work, has always been able to get exact information in regard to the many questions coming up, and particularly in regard to organizing, in which Dr. Fernow is a veteran; and not only has he been in touch with Mr. A. H. D. Ross, the ex-secretary of the Association, and the other members of the Faculty, but he has also come into contact with forty young men looking to forestry as their profession, who come from all parts of Canada. If these advantages could be combined with those possessed by Ottawa, the situation would be ideal; but, now that the connection has been formed, it is hoped the Secretary will be in Toronto often enough to keep it vital and strong.

FIRE LOSSES IN U. S. FORESTS. The loss from fire in the U. S. National Forests during 1909 was much less than that of the preceding year. Three hundred and sixty thousand acres were burned over in 1909, as against 400,000 acres in 1908. In 1909 170,000,000 board feet of timber was consumed, as compared with 230,000,000 in 1908. The loss in value of timber destroyed was less than \$300,000, only two-thirds of that of 1908. Damage to reproduction and forage in 1909 was less than one-fourth of that of the preceding year.

NEW BRITISH COLUMBIA RESERVE. The Government of British Columbia, by order-in-council of May 31st, has reserved an area of two hundred and seventy-six square miles, on Vancouver Island, extending from Crown Mountain south and including all but the extreme northerly portion of Buttle's Lake and the surrounding country. This is to be set apart for a public park. This action is the result of an agitation that has been going on for some time, the chief organizations taking part being the Natural History Society, the Vancouver Island Development League and the Board of Trade.

CONSERVATION COMMISSION'S REPORT. The first annual report of the Commission of Conservation has been issued and is ready for distribution.

It contains the full text of the addresses given at the meeting, an abridged account of which appeared in the April **CANADIAN FORESTRY JOURNAL**. Articles of special importance to those interested in forestry are: "Scientific Forestry in Europe, its Value and Applicability in Canada," by Dr. B. E. Fernow; "Diseases of Forest Trees," by Dr. H. T. Gussow; "Insects Destructive to Canadian Forests," by Dr. C. Gordon Hewitt; "Fur-bearing Animals in Canada and How to Prevent their Extinction," by F. T. Congdon, M.P. The inaugural address of Hon. Clifford Sifton is of the greatest value to advocates of conservation, in whatever direction their special interest may lie. The act establishing the commission, the amending act the order-in-council appointing commissioners and the personnel of the committees are also given.

After concluding the academic and practical work of the year in the Department of Forestry of the University of New Brunswick, it is likely Prof. R. B. Miller will spend some part of the summer in Indiana.

Mayor M. Goffatt, of Orillia, Ont., has been urging on the provincial authorities the establishment of municipal forest reserves. Towns could well undertake the work, he thinks, using their police forces to patrol the forest, thereby carrying out the work of protection at a small cost.

On May 18th, during the absence of the Secretary from the office at 11 Queen's Park, Toronto, some member sent his renewal membership fee of one dollar by messenger. The envelope was the printed one bearing the Secretary's name and address, but there was no mark of any kind by which to identify the sender. If the member in question will kindly communicate with the Secretary he will be duly credited with the fee.

TREE DISTRIBUTION IN WEST. A new feature in the tree distribution work from the Indian Head Nursery this year was the distribution in quantity of coniferous stock, about 62,000 seedlings of eleven species of conifers having been sent out; of these much the greater proportion were tamarac and Scotch pine. In all about 2,600,000 trees were distributed, approximately the same number as for several years past. The nursery has now reached nearly the maximum of production, and if the work is to be carried on on the present scale, some arrangement will have to be made looking to its enlargement. Owing to the practically stationary number of trees to be distributed and the greatly increasing number of applicants, the average number of trees sent to each applicant this year was but 800, while in 1908 it was 1,400. The following figures show the increase in the work of this division of the Forestry Branch: No. of applicants on the books in 1908, 3734, in 1910, 8,318; No. to receive trees in 1908, 1,424, in 1910, 3,173; No. of new applications in 1909, 2,235, in 1910, 3,832.

NEW TIMBER REGULATIONS IN QUEBEC. The most noteworthy feature of the timber regulations recently promulgated in the Province of Quebec is clause 13, which reads: "All timber cut on Crown lands after May 1st, 1910, must be manufactured in Canada, that is to say, converted into pulp or paper, deals or boards, or into any other article of trade or merchandise, of which such timber is the raw material." This includes railway ties and timber completely squared, but does not include "timber simply cut into lengths, piled, barked or otherwise worked preliminary to the manufacture of pulp, paper, deals, etc." Definite action is thus taken in regard to prohibiting the export of pulpwood cut on Crown lands. The ground rent is fixed at \$5 per square mile, subject to increase if the limits are not operated, and any infringement of the law or regulations forfeits the right of the holder to renewal. The transfer fee is made \$4 per square mile. Forest rangers and other departmental officers are to be given the right to enter on the limits in the performance of their duties and are to have free access to all books relating to the operations. The present regulations will remain unchanged until 1920.

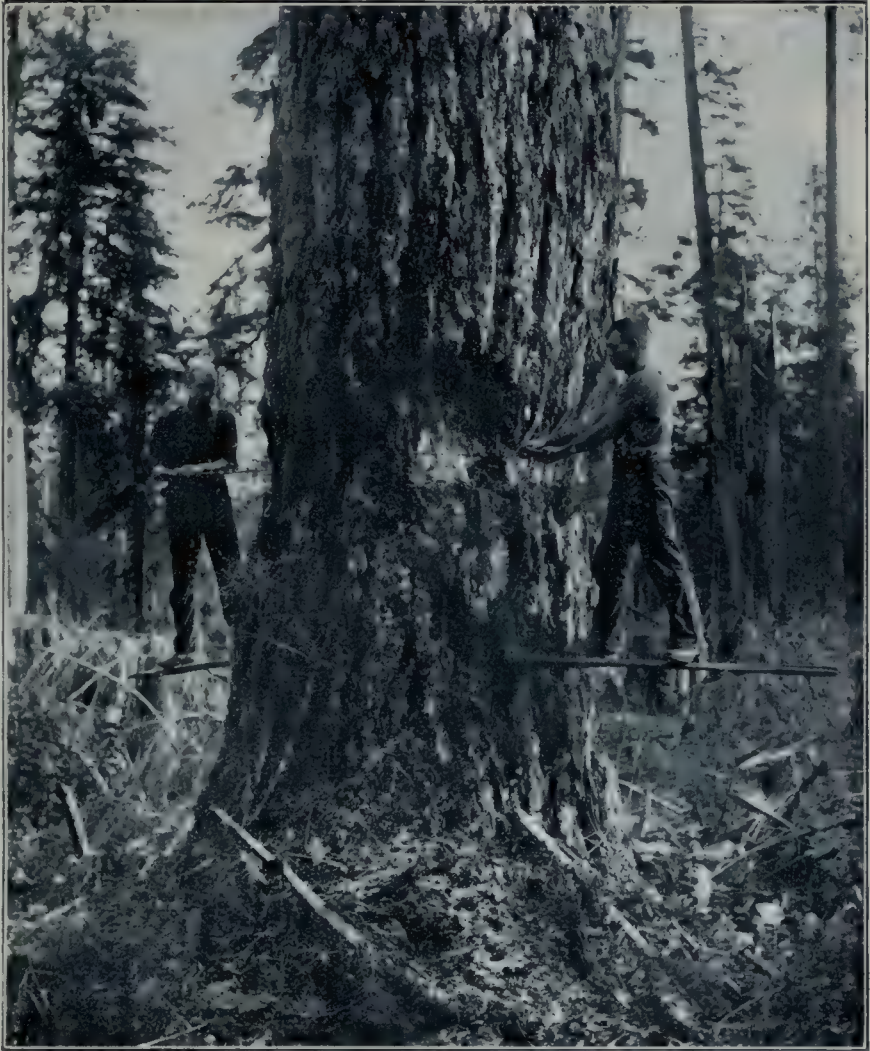
That the work of the Canadian Forestry Association is widely known and appreciated is shown by the fact that in one week recently new members were enrolled in various parts of Canada and in the United States, Ireland and the Sudan. The member from the Sudan was Mr. George Robinson, B.A. B.A.S., Inspector of Woods and Forests to the Sudan Government.

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No 3



Felling a British Columbia tree. Much timber wasted by leaving the stump so high.

FORESTRY CONVENTION— Arrangements are now under way for a Dominion Forestry Convention in Quebec province early in 1911. Particulars will be announced as early as possible.

Canadian Forestry Journal

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Forest Fires and Railways

By R. H. Campbell, Dominion Superintendent of Forestry.

The vicinity to a forest of a railway either in construction or operation makes the danger of fires more intense. This is partly due to causes connected with the railway itself, and partly due to the crowds of land-seekers, prospectors, freighters, tramps and other people equipped more or less generally with a fine bump of irresponsibility who accompany or follow it. The record of each year's conflagrations shows the railways well up in the list of the causes of forest fires. If they do not lead they always follow close in the black array. It is of interest, then, to consider the relation of the railways to forest fires. In doing so the subject will be confined to the fires which are due directly to the railways.

Railway Construction.

In the construction of the railway it is necessary that the right-of-way should be thoroughly cleared. If dead tops, limbs and stumps are left scattered over the right-of-way or piled just outside of it, as has usually been done, they become a veritable fire-trap, and the destruction of the surrounding forest is an inevitable consequence sooner or later. The regulations for clearing the right-of-way adopted by the Transcontinental Railway Commission are now being generally followed. They provide as follows:—

“The whole, or as much of the right-of-way as the engineer may direct, shall be entirely cleared of all

trees, logs, brush and other perishable matter; all of which shall be burnt or otherwise disposed of as the engineer may direct, unless specially reserved to be made into timber, ties or cordwood. Unless directed in writing by the engineer, trees and brush must not be thrown on adjacent lands, but must be disposed of on the right-of-way. Trees unavoidably falling outside the right-of-way must be cut up, removed to right-of-way and disposed of.”

But the establishing of a regulation is not the carrying of it out, and in order to ensure the carrying out of such regulations as these thoroughly it is necessary to place a fire patrol along the line of construction. This has been done along the line of the Grand Trunk Pacific Railway through Dominion territory west of Edmonton with good results. Fire from the right-of-way has not burned forty acres outside its limits, although the right-of-way has been cleared and burned thoroughly in that district. But the ranger in charge had to use authority and judgment. Some contractors were allowing debris to gather close against the edge of the right-of-way where, when burned, it would lead fire into the forest. These contractors were stopped and made to clear a space between the brush heap and the forests. In the dry and dangerous season of the year the ranger prohibited burning altogether. The engineers of the rail-

way company, the contractors and the forest rangers all worked cordially together to attain the desired object.

With such regulations and with a good fire patrol to supervise their enforcement the danger should be largely obviated. The uncertainties of handling fire are, however, well illustrated by an incident which occurred in the clearing of the right-of-way on the construction of the Canadian Northern Railway north of Prince Albert. The refuse was being burned on the right-of-way and the clearing gang was watching the fire. A small whirlwind came down the right-of-way, lifted the fire and threw it into the bush over the men's heads and, before it could be stopped, nearly a square mile of bush was burned. In dry, windy weather such a danger is always present, and it gives pause to those who are responsible for the administration when the promiscuous use of fire for clearing land after lumbering operations or on other occasions is advocated.

Clearing Right-of-way.

After a railway has been constructed and is in operation there will still be danger if the right-of-way is not kept cleaned up and the Railway Act of the Dominion provides (as do most of the provincial railway acts in almost similar terms) that:

"The Company shall at all times maintain and keep its right-of-way free from dead or dry grass, weeds and other unnecessary combustible matter."

This provision of the Act has, at least in the newer districts, been more honored in the breach than in the observance, and yet it is one of the most critical and important measures in the prevention of forest fires in those newer districts. The Canadian Pacific Railway Company, in accordance with representations made by the Department of the Interior, are clearing up the right-of-

way through British Columbia and the Rocky Mountains by contract, and are burning the debris at safe seasons. The failure of the Canadian Northern Railway to respond to similar representations was a contributing cause to the fires which did so much damage along the Prince Albert branch of that railway during the past spring.

The necessities of the case left no choice but an appeal to the Railway Commission to have the provision of the act in this respect enforced. The question was brought to the attention of the Commission, and on the 15th August, 1910, an order was issued by the Board to the desired effect. After quoting the provisions of the Railway Act in regard to clearing the right-of-way of noxious weeds and combustible material, the order continues:

"Complaints continually come to the Board that these sections are not observed by some of the companies, casual observation in some parts of the country shows that Section 297 (in regard to the removal of combustible material) is being entirely overlooked. It is clear that many fires are communicated to adjacent lands by reason of companies not complying with these provisions of the law, entailing enormous loss. The Board deems it to be its duty to see that these sections are enforced, and to that end has given instructions that all railway lands shall be periodically inspected and full reports made of the conditions found to exist.

"This is a matter of vast moment in the preservation of timber lands as well as the protection of property of all kinds along railway lines and steps will be taken to enforce the law unless voluntarily complied with."

The immunity from fire of the forests along the lines of railway in Europe is partly due to their hauling lighter trains and using a better quality of coal, but it is largely due

to the careful clearing and keeping clean of the right-of-way. In addition, however, the forest is kept clear of dead material, and on each side of the railway a path is kept cleared even of leaves and grass, and the surface is broken up so as to provide a fire-break for ground fires.

It will be necessary to clear the dead timber from lands outside the right-of-way in Canada if safety is to be assured, and when a permanent policy of forest reserves has been established the public interest will make it profitable to do so. Where the railway lines run through reserves, as in the Rocky Mountains Park, steps are being taken to carry out such work. With the vast

The burning of old ties along the right-of-way in a dangerous season is a frequent source of trouble and should be covered by regulation so that the burning should not be done in a time of danger. Most of the railways are regulating this better now than they have in the past, but it is still a not infrequent cause of damage. Fires starting from such a cause would, however, be considered as caused by negligence and would render the company subject to action for damages under the common law.

Locomotive Equipment.

Sparks from the locomotives are the most frequent cause of fires along

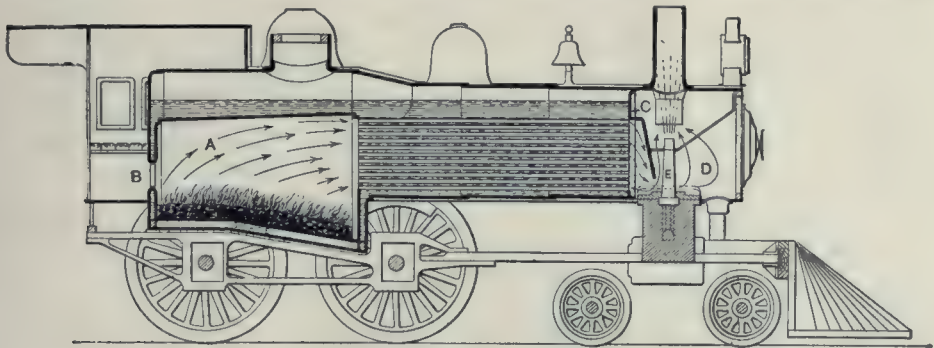


FIG. 2.

Longitudinal section of Locomotive. (A, fire-box; B, cab; C, front head of boiler; D, smoke-box or front-end; E, pipe from which exhaust steam escapes. Baffle-plate may be seen just behind E.)

stretches of forest land along railways in Canada and our uncertain forest policy it is futile to advocate the general adoption of such a plan.

There should be no confusion as to the position in regard to the railway right-of-way. The present right-of-way of usually one hundred feet is sufficient for forest purposes, if it is sufficient for railway purposes, and nothing better can be done than to bring the green timber up to the edge of the right-of-way, but the right-of-way and a considerable space on either side of the right-of-way should be thoroughly cleared of dead timber and combustible material.

the railways. These may be caused by the use of inferior fuel. Wood or lignite coal will, with any screen or device, almost certainly throw fire from the smoke-stack, and it is in the newer districts back in the bush that railway companies are most likely to use such fuel. The regulations of the Dominion Railway Commission provide that no railway company subject to the legislative authority of the Parliament of Canada shall burn lignite coal on its locomotive engines as fuel for transportation purposes. Lignite coal is defined as including all varieties of coal the properties of which are intermediate between

wood and coal of the older formations. The penalty for violation of this rule is a fine of twenty-five dollars, which hardly seems adequate.

The construction and equipment of the locomotive have much to do with the tendency to throw sparks. In England the inclination has been to depend more on the plan of construction of the locomotive than on the arresting screens. In Canada and the United States screens are considered a necessity and are provided for by statutes and regulations. In the modern locomotive there is an extension smoke-box at the front end. Sparks passing through the boiler tubes forward toward the smoke-stack strike against a plate inclined downward, called a baffle plate, and are thrown to the bottom of the smoke-box whence they rise against the netting stretched across the smoke-box to divide it from the smoke-stack and are again thrown back, and so are dashed around until they are finally worn down small enough to pass through the openings of the netting. The regulations of the Dominion Railway Commission provide that every locomotive engine having an extension smoke-box shall be equipped with netting mesh, the mesh to be not larger than $2\frac{1}{2} \times 2\frac{1}{2}$ per inch of No. 10 Birmingham wire gauge, and to be placed in the smoke-box so as to extend completely over the aperture through which the smoke ascends,—the openings of the said mesh not to exceed a quarter of an inch and one-sixty-fourth of an inch to the square inch. When the diamond stack, the old style, is used the mesh required is 3×3 per inch of No. 10 Birmingham wire gauge and it must be placed across the stack so as to entirely cover it. The opening allowed in this case is three-sixteenths and one-sixty-fourth of an inch to the square inch.

The openings of the ashpan must be covered with iron dampers or net screens securely fastened, and the

outflow pipes from the injectors must be put into the ashpans from April to October inclusive.

With these precautions and equipment it would appear as if the question of fires from locomotives was solved, but fires caused by locomotives still continue. Is it that the equipment is not sufficient, or that it is not used and kept in proper order?

The regulations of the Dominion Railway Commission provide that the locomotives shall be inspected by an official of the railway company at least once in every week to see that the equipment is in proper order. Yet fires occur, and when the fact that a locomotive is throwing sparks is brought to the attention of the railway company the invariable reply is that an inspection has been made and the locomotive and equipment are found in proper order. From this it would appear as if the equipment were not sufficient, and as the Railway Commission are satisfied that any decrease in the openings of the netting mesh would seriously interfere with operation, the efficiency of the equipment probably cannot be increased. And it may be frankly admitted that the evidence goes to show that, even with the best equipment, a heavily loaded locomotive on a steep grade or with an unskilful driver will throw dangerous sparks.

But is an *ex parte* inspection by the railway officials sufficient to show that the locomotives are properly equipped? It would seem as if an impartial inspection applied when the case of fire-throwing by a locomotive occurs would be the surest way and the most convincing to the public for determining this question. The Railway Commission has a force of qualified inspectors, but the smallness of the force compared with the extent of the Dominion makes it simply impossible to have a close or quick inspection. To assist towards a closer government inspection the Railway Commission has arranged to give authority to

some of the permanent forest rangers in the Dominion service at divisional points on the railways to make inspections of locomotives so that inspections may be made immediately when a locomotive is reported to be throwing sparks. With this closer inspection and a careful study of the equipment it may be possible to reach a solution of the problem which will give comparative safety.

The penalty for violation of the regulations in regard to equipment and inspection of locomotives is twenty-five dollars as against the company and fifteen dollars as against an employee.

Damages.

The Railway Act did not until

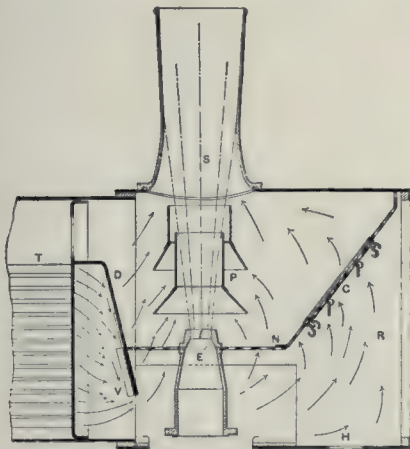


FIG. 10.

Smoke-box or front-end of locomotive. (T, boiler-tubes; D, baffle-plate, or diaphragm; N, netting, dividing smoke-box into upper and lower chambers; S, stack; E, exhaust-pipe. Arrows show direction of draft.)

1903 contain any specific provision in regard to damages for fires caused by railway locomotives. It was apparently considered that the matter was governed by the common-law principle that no person should be permitted to use his property in such a way as to result in injury to his neighbor, and decisions in various Canadian cases were given on this principle. On this point being

carried on appeal to the Imperial Privy Council in the case of the Canadian Pacific Railway Company vs. Roy, it was decided in 1902, in accordance with previous decisions in the English courts, that inasmuch as Parliament had given the railway companies authority to run locomotives they would not be liable for damages for doing so, provided no negligence was proved. It may be pointed out, however, that the wording of the Railway Act is to the effect that the railways may operate "by the power and force of steam" and does not in so many words make lawful the running of locomotives, as the English Act does. The running of a locomotive without statutory authority or the running of a traction engine along a roadway would come under the common-law principle.

As the Railway Act requires the right-of-way of the railway to be kept clear of combustible material the failure of a railway company to keep its right-of-way cleared would amount to negligence at common-law and would make the company liable for the full amount of damages sustained. This would be the case whether the fire was set by a locomotive or otherwise, so long as it originated on the right-of-way. It might be caused by burning of the combustible material on the right-of-way for the purpose of clearing, but the company would still be liable for full damages.

But in cases where there was no negligence of this or some other nature was shown the railway company was not, according to the decision given, responsible for damages.

In 1903, therefore, the question was brought before Parliament by Mr. L. Philippe Demers, M.P. for St. John's and Iberville, who proposed a provision to make the railway responsible for damages caused by sparks from locomotives under the common-law principle, whether or not negligence was shown. The provision proposed was, however,

modified into the following, which has also been included in most of the provincial railway acts:

“Whenever damage is caused to crops, lands, fences, plantations or buildings and their contents by a fire started by a railway locomotive, the company making use of such locomotive, whether guilty of negligence or not, shall be liable for such damage and may be sued for the recovery of the amount of such damage in any court of competent jurisdiction: provided that if it be shown that the company has used modern and efficient appliances and has not otherwise been guilty of any negligence, the total amount of compensation recoverable in respect of any one or more claims for damage from a fire or fires started by the same locomotive and upon the same occasion shall not exceed five thousand dollars.”

The company was also given an insurable interest in property along its route.

While this section does not expressly include forests and timber, damages have been obtained under it for timber and cordwood destroyed, so that it may be considered as sufficiently comprehensive though it would be better if made clearer on this point.

While the railways are a great public convenience, there does not seem to be any valid reason why they should not be subject to the common law in regard to damages in all particulars the same as any other company. It has been decided by the courts that the Dominion Parliament has authority to make enactments in regard to railways acting under Dominion charters, even in matters affecting property and civil rights which under other circumstances would be wholly in provincial jurisdiction. If the Dominion statute withdraws these railways from the common law it would seem only right that the Dominion Parliament should supply the defect through its own jurisdiction.

It may be added that the Railway Commission has decided that it has no jurisdiction in damage suits.

Penalties.

It is expressly provided in the Railway Act that the imposition of penalties does not affect claims for damages. As has been noted previously, the penalties for infractions of the regulations of the Railway Commission in regard to equipment and inspection of locomotives and the quality of fuel are fixed by the Board at twenty-five dollars as against the company and at fifteen dollars as against the employee. These penalties are fixed under authority given the Board to provide penalties for offences against the regulations in cases where not already provided for in the Act, but not to exceed one hundred dollars. These penalties seem small, but if rigorously enforced under a close system of inspection may be sufficient as a deterrent, which is the object desired.

Where the regulations of the Commission do not provide penalty, as, for instance, in case of failure of the company to clear its right-of-way of combustible material, section 427 of the Railway Act will probably apply. This provides for a penalty of not less than twenty dollars and not more than five thousand dollars for any contravention of, or failure to comply with, the provisions of the Act or regulations by the company or any person acting for or employed by the company; and is intended to cover any case not otherwise provided for in the Act.

The burning of ties or the clearing of the right-of-way by fire at a dangerous time are not covered by the Railway Act or the regulations, and apparently would not be covered by any penalty.

There is room for improvement of the Act in the matter of penalties, as well as of damages, to make the penalties sufficient as a deterrent and to make them cover all possible items of danger.



Forestry and Botany Building and Botanical Garden, University of Toronto

The Forest School—A Growing Institution.

What is being done in Canada and the United States.

The pictures in this issue are largely devoted to the Canadian Forest Schools and some of those of the United States. As Hon. Clifford Sifton stated at the Fredericton Convention of the Canadian Forestry Association last February, when he established the Dominion Forestry Branch, he was told there was not one technically trained forester in Canada. Canadian schools to supply this need did not exist until the autumn of 1907, when the University of Toronto established a Faculty of Forestry under Dr. B. E. Fernow. This was followed in the next year by the establishment of a course at the University of New Brunswick, Fredericton, under Mr. R. B. Miller, a graduate of Yale Forest School. This autumn there has been opened a Forestry Department at Laval University, Quebec, with Mr. G. C. Piche, also a Yale graduate, as Director. The number of students in attendance at these schools is in-

creasing rapidly, so that Canada will soon have a number of her own trained foresters.

In the United States forestry schools have been established for a considerably longer time, and hitherto most Canadian foresters were trained at Cornell, Biltmore, Michigan or Yale.

In all these schools there is a combination of classroom and laboratory work with practical work in the woods. This is necessary in order to turn out men who can handle the varied and important work which woods operations entail. The woods sessions of the Toronto University school are held at different lumber camps in the north country. In 1909 they were on the south shore of Lake Nipissing, and in 1910 on Nine Mile Lake near Bala, Muskoka. The Fredericton school has the advantage of a cut-over area of about six thousand acres immediately behind the University cam-

pus. At Laval it is expected that students will get their practice work in connection with a Department of the Provincial forest service which has been under Mr. Piche for some years. The Biltmore School spends the greater part of each year in the United States and the remainder in Europe, all the work being carried on in or contiguous to the woods. Yale has its permanent camp for the junior year at Milford, Penn., while the senior year woods work is taken at a lumber operation, generally in Texas or some other point in the south.

This year the Secretary of the Canadian Forestry Association visited the camp of the Toronto school at Nine Mile Lake, as described in the last issue of the *Journal*, and later spent two weeks at Milford. There were twenty-four students and four instructors at the former; and sixty students and ten instructors at the latter. In both the young men were of a vigorous, self-reliant type; those at Milford being probably a year older on the average than those at Nine Mile Lake. Yale has at Milford a very complete plant situated on the estate of the late James W. Pinchot (father of Mr. Gifford Pinchot) who with other members of his family was the founder of the school. This is a hilly cut-over country, long settled, but so

much better for timber-growing than for farming that it is gradually getting back into timber, except in the bottom lands. The practice grounds are on the estate itself and on several of the neighboring estates (properties of 800 acres or so) which are controlled by the school. There are four permanent frame buildings, viz., two classrooms, a dining hall and an office, while instructors and students live in tents which are erected in two long lines near the classrooms. As most of the tents are occupied by but one person there are something like sixty tents in the camp. This woods course which begins about July 7 lasts ten weeks and is the introduction of the student to the study of forestry. Those who do not like the sample, or who cannot stand the pace, do not go on to New Haven for the further course.

At Milford the boys rise at 6.30, breakfast at 7, then gather in the classrooms to receive instructions for the day's work, then to the fields for surveying, or to the woods for forest mensuration or dendrology. Those who go to points at some distance take lunch with them and return about 5 p.m. It is generally warm work in the woods in July and August, and there is usually time for a dip in the swimming pool of the Sawkill River before dinner at 6. After dinner the boys make up their

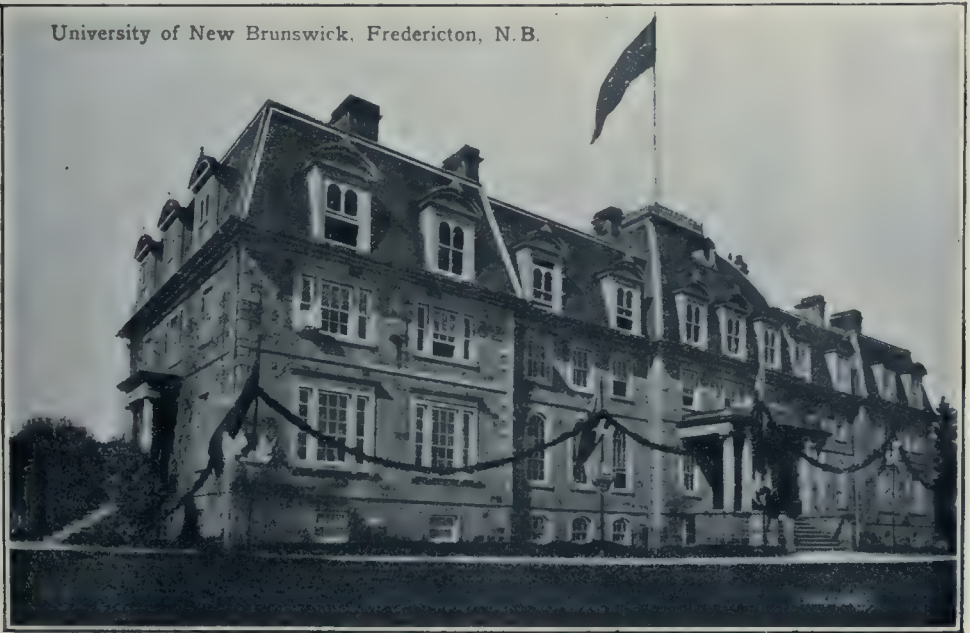


Making up Tables and Reports. Toronto University Camp.

reports and work out their yield and volume tables, being usually busily engaged until bedtime. There are thus many points of similarity between the work at Milford and that at Nine Mile Lake described in the last issue of the Journal. In fact the types of men in the two camps were so similar that if the Canadian camp were held in warmer weather, when the men would wear lighter clothing, it would be impossible to tell, without knowing individuals,

Assistant Professor of Forestry, was in charge of this year's camp. As noted in the case of the Toronto school camp the life is a strenuous one, and a forest school course is only for the vigorous and the fit. The pace is too hot for delicate young men, for whom, in spite of erroneous impressions on the part of some fond aunts and mammas, forestry is not "just the thing." Milford has one other advantage in that it is nearly free from mosquitoes,

University of New Brunswick, Fredericton, N.B.



Main Building, University of New Brunswick, containing Forestry Dept. headquarters.

whether a given photograph represented one group of men or the other. Yale is the school from the head of which Prof. H. S. Graves was taken last winter to become United States Forester, after the dismissal of Mr. Gifford Pinchot. The present head of the school is Prof. J. W. Toumey, Acting Director, who has been for many years connected with Yale Forest School as Professor of Silviculture, while Mr. R. C. Hawley,

which accounts for the scanty clothing as shown in some of the pictures. The Secretary had not an opportunity of going out with the boys of the University of New Brunswick, but he tramped over a part of their wood lot behind the main building and secured some photographs of them at work in the woods to use in his lecture work, which will later appear in *The Journal*.



Group of Students at Yale Forest School Camp, Milford, Penna., U.S.A. The view shows Part of the Camp.

Nova Scotia Water Powers

By W. G. Yorston, C.E., Sydney, N.S.

(Extracts from a paper read before the Nova Scotia Society of Engineers at the annual meeting of the society for 1910.)

I may say at the outset that I have been connected with the water-powers of Nova Scotia long enough to have become an enthusiast on the subject, and it is some time now since I arrived at the conclusion that our water-powers are destined to become of great value in our industrial life, and I think that my conclusions are amply justified by the increasing development of water-powers in the province. At the same time I am fully aware that the water-powers we have do not for one moment compare in magnitude with those in some of the sister provinces of the Do-

minion; still this does not alter my opinion that even the comparatively small powers we have are of great value and will ultimately be all taken advantage of and used as powers to turn the wheels of some kind of factory.

The province of Nova Scotia, for its size, is one of the richest in the Dominion of Canada and its resources for the most part are only in the beginning of their development.

White Coal or Black?

At this date it is beginning to be realized that our forests are being

rapidly depleted and we are awakening to the fact, besides, that much of their timber has been sacrificed. It is not at all improbable that in a few years more will be heard a similar cry with regard to our coal deposits. In this age the people are beginning to take cognizance of the fact that the great natural resources of the country are valuable and worthy of preservation and that to continue to barter them away, as in the past, for a mere pittance is the worst kind of folly. Already in the province of Nova Scotia a halt has been called in the reckless disposition of Crown lands.

Before the perfection of the steam engine water-powers were largely relied on to furnish power for all kinds of industries, but after the steam engine came into general use steam power gradually supplanted the old water powers, and this was largely contributed to by the cheapness of coal. Of late years, however, there has been a marked increase in the price of coal, and as far as can be seen at present the prices will not again decline, but on the other hand will most certainly further increase. This being so, it is almost inevitable that our water powers will begin to receive more and more attention, in spite of the fact that further improvements will undoubtedly be made in the economy of the steam engine.

Data Imperfect.

The province of Nova Scotia has no large rivers and the watersheds on which water may be collected are comparatively small. Six hundred square miles is about the area of the largest watershed in the province that the writer is aware of, and the average watershed area of streams is probably not more than one-third that amount. This is compensated for to some extent, however, by the fact that many of our streams have a rapid descent and offer fairly high heads for the utilization of the water. In the province there are

powers to be found capable of development under heads of from 100 to 400 feet, although in every case where such high head exists the watershed is limited in extent. I may say in this connection that I have investigated one water-power having but ten square miles of watershed which is well worth development, as there is a total fall of 275 feet in a little over two miles, as well as practically unlimited opportunities for storage of water on the watershed.

In all parts of the province there are water-powers which are well worth development and which have not so far received attention. On others of our streams the development is fairly well advanced, and some few of our rivers, particularly the Mersey and St. Croix, are at present generating quite an amount of power. At the same time no one of our streams has the development of its full power completed, and in general it is true that so far our power developments have been on those streams which have the greatest amount of natural storage in the shape of lakes, and practically nothing has been done in the way of creating storage artificially, in order to improve the powers on streams having a deficiency of natural reservoirs.

It is most unfortunate that so far no data as to stream flow in the province of Nova Scotia is obtainable. The only information to be had bearing on the subject is the rainfall records taken at a few places in the province. It is not often that even the rainfall records for the immediate locality of the stream are to be got, and recourse must be had to records for other places, distant sometimes over a hundred miles. It is evident that calculation based on such data must be after all only an approximation, the accuracy of which will depend in large measure on the judgment and experience of the one who is making them.

How Powers Might be Utilized.

At this date so little demand for water-power has been in evidence that all the facts in connection with some of the best Nova Scotia water-powers are not even fully known. It is found that, as a rule, the majority of our large factories are located in the large centres of population, and for many of the different factories there are considerations which make this imperative. At the same time

we should be a unit as regards anything that makes for the betterment of our native province. Already our progressive spirit has shown itself in much of our recent legislation, and in at least one or two regards we lead our sister provinces of the Dominion of Canada. To bring the country to its highest development it is absolutely necessary that all Nova Scotians should become imbued with an abiding faith in their native province and its resources—not a passive faith such as has perhaps marked us



University of Toronto Forestry Students making plane-table survey of Nine Mile Lake.

there are very many uses to which our scattered powers could be put, of which the more vigorous prosecution of our mineral development is only one. Besides very many of our powers are sufficiently large to warrant the expense of quite lengthy transmission lines in order to utilize the power at some more convenient point where manufacturing can be more economically carried on.

Whether or not we are of one mind as to how our water power problems should be solved, as Nova Scotians

in the past, but a faith in our future prospects so intense as to dim the most enticing allurements from abroad. When we have all realized that in our native province we possess as goodly a heritage as could be allotted to mankind, and when we shall all have the courage of our convictions and put our energies and cash into industries and developments at home, instead of looking for investments abroad, then will come our full measure of prosperity. And who shall know the limit of it?



Class of Yale Forest School studying Trees, Prof. Toumey at the right.

With Other Forestry Organizations

Notes on the Work at Washington and Philadelphia.

During the summer the Secretary paid a visit to the city of Washington where he consulted the Secretary of the American Forestry Association, Mr. E. A. Start, upon methods and details of organization. The American Forestry Association is considerably older than our own association, and to a certain extent has been the model upon which the Canadian Forestry Association has been moulded, though, of course, each has developed in its own way along certain lines, as circumstances indicated. The American Forestry Association has a suite of offices in the Maryland Building and a very complete equipment for carrying on its work. Mr. Start gave up his time most kindly and endeavored to put

Mr. Lawler in touch with everything found valuable in the working of the society. Previous to assuming the secretaryship of the American Forestry Association, Mr. Start was Secretary of the Massachusetts Forestry Association, and has thus had a great deal of experience in the work.

At the conclusion of these interviews, Mr. Start took Mr. Lawler to the office of the United States Forest Service and introduced him to the officials there. Mr. H. S. Graves, United States Forester, was then on an inspection trip in the west, but Assistant Forester A. F. Potter gave a bird's-eye view of the immense work carried on by the Forest Service. Following this up, the Secretary had several interviews with Mr.

Bristow Adams, in charge of publications for the Service. The Service takes the view that educating the public is a part of its work, just as in the other branches, and in consequence a corps of lecturers is kept in the field giving the principles of forestry as related to the farmer's woodlot, the city street and park and the lumber forest. Pictures are used in this work to a great extent and the Forest Service has filed for use over 30,000 photographs illustrating forestry in America in all its bearings. Besides this from these have been made several thousand lantern slides which are used by the lecturers in illustrating their talks. Other photographs are reproduced in large size and series of these suitably mounted are sent from public school to public school throughout the United States so that the children may learn the value of the forest, the dangers arising from deforestation and the criminality of leaving unquenched camp fires, and, on the other hand, what can be done by good lumbering and by reforestation in either keeping up the forest or replacing it where it has been destroyed. Besides this there are issued numbers of most useful bulletins on all these things and on insect and fungus pests, etc. In fact the publications branch of the Forest Service is a large department in itself and doing an immense amount of work which so far no government has yet attempted to do in Canada.

Another aspect of the work was touched when the Secretary visited Philadelphia and called upon Mr. F. L. Bitler, Secretary of the Pennsylvania Forestry Association. This Association is one of the oldest in the United States, and as a result Pennsylvania has on its statute books excellent laws in regard to forest fire protection. The state has also bought back about one million acres of land and is devoting it to forestry. Pennsylvania, in addition to the economic and agricultural aspect of forestry, has devoted much attention

to the health side, and has a number of sanatoria in the state forests, besides throwing these forests open to the people of the state as healthful camping grounds. Forestry by private individuals has also received much attention in Pennsylvania, and there are to be heard glowing accounts of the success of some of the pioneers in this line. This does not refer in this instance so much to careful lumbering of timber tracts, which is now beginning to be in evidence in many parts, but to the purchase of abandoned farms or of burnt-over and cut-over tracts and the getting of them back into timber. The people of Canada will make a mistake if they think that the people of the United States are not becoming aroused to the forestry problem, and a still greater one if they think that Canada is the first on this continent to take restorative measures. Canada had, as compared with most states, a better method of timber disposal, but as to applying the remedy for wrong conditions much more has been done south of the boundary line than north of it.

The trip throughout was a most informative one, and the Secretary hopes to be able to incorporate in his work much that he learned in Washington and Philadelphia.



RAPPORT ANNUEL EN FRANÇAIS.

Le rapport annuel en français, de l'Association Forestière Canadienne, est maintenant prêt à être imprimé.

L'année dernière, l'édition a été de 2000 copies qui furent distribuées promptement.

Que tous ceux qui désirent recevoir une copie de ce rapport soient donc assez bons de notifier le Secrétaire aussitôt que possible, afin que le nombre imprimé soit suffisant. Ce rapport, comme les autres publications de l'Association, sera naturellement gratis pour les membres et pour les autres intéressés dans la cause.



Main building of Laval University, Quebec, where a forest school has just been opened.

Monseigneur Laflamme

On se rappelle combien ces deux phrases pleines d'horreur dans leur simplicité: 'Madame se meurt. Madame est morte,' produisirent, comme le dit Bossuet dans une de ses oraisons funèbres, de surprise et de consternation. A cette nouvelle, ajoute le brillant orateur, tout le monde se sentit frappé, comme si quelque accident avait désolé sa famille. Ce que Bossuet disait de la mort de la princesse Henriette, nous le pouvons dire, et avec combien plus de raison, de la mort de Monseigneur Laflamme.

En effet, Monseigneur Laflamme s'était fait partout, et au sein de l'université, et dans sa province, et dans le Canada, et à l'étranger, une réputation de savant et de vertueux prêtre. Il avait contribué à jeter beaucoup d'éclat sur l'enseignement

universitaire et à montrer, une fois de plus, que le clergé Canadien sait à la vertu ajouter la culture intellectuelle.

Ceux qui, comme moi, l'ont connu dans l'intimité et comme professeur, savent combien agréable était son commerce et combien captivantes ses leçons. Réalisant, qu'un professeur d'université ne doit pas uniquement se consacrer aux études qu'il est chargé d'enseigner, mais doit, au contraire, avoir des connaissances générales, universelles, il s'était intéressé à tous les problèmes que la science a posés et que l'intelligence humaine a tâché de résoudre. Et c'est l'éten due de son savoir, aussi bien que le pétillant de son esprit, qui rendait sa société agréable, et le faisait rechercher par quiconque le connaissait.

Il était réellement né professeur : dans un style sobre, imagé, alerte, semé de pointes fines, il savait faire passer dans l'esprit de ses élèves, les connaissances variées, que lui avait données le commerce assidu de livres bien choisis, et qu'il s'était assimilées avec une rare facilité, et les nombreuses observations, qu'il avait cueillies au cours de sa longue expérience, de ses courses géologiques et de ses missions scientifiques.

Né à St-Anselme en 1849, il était, après de brillantes études, nommé professeur de Science Naturelle, à l'âge de 22 ans, et il ne cessa d'enseigner que l'an dernier. Sa haute culture et son profond savoir lui valurent des honneurs et des charges, qu'il n'avait pas recherchés, craignant qu'ils ne prissent trop de son temps consacré à l'étude.—et dont il se trouvait indigne, tant il était modeste. Recteur de l'Université, membre fondateur de la Société Royale du Canada, dont il fut président—1891-92,—protonotaire apostolique, chevalier de la Légion d'Honneur, membre de nombreuses sociétés savantes d'Amérique, de France et de Belgique, les dignités religieuses, civiles, académiques lui vinrent tout naturellement.

On sait qu'il se dévoua, au cours de sa carrière féconde, tout spécialement à la géologie et qu'il ne contribua pas peu à enrichir de découvertes précieuses—(mentionnons celle des terrains quaternaires de l'île Anticosti) — les observations antérieures des géologues Canadiens. Mais s'il fut savant géologue, il ne fut pas moins forestier averti, et c'est surtout parce qu'il fut ceci, qu'on lui doit, dans cette revue, une

très large place. En effet, il a réalisé combien c'était une œuvre sociale et patriotique que d'encourager les Canadiens à conserver leurs forêts, à ne les exploiter que méthodiquement afin de ne les pas détruire. Il a mis toutes ses énergies à éclairer, en la province de Québec, l'opinion publique sur ce point, et il n'a pas peu contribué à refaire à ses compatriotes une mentalité nouvelle en ce qui a trait à l'exploitation forestière. C'est lui, qui, soucieux de notre richesse forestière et de l'avenir d'icelle, a préconisé la création d'une école, où des ingénieurs forestiers seraient formés pour veiller à l'exploitation judicieuse et raisonnée de nos bois. Cette école, dont le gouvernement Gouin vient de doter notre province, est une des œuvres dont Mgr. Laflamme désirait ardemment la réalisation. Il s'est à ce point identifié avec cette œuvre, au succès de laquelle il a travaillé de toutes ses forces, qu'elle est pour ainsi dire sienne, et qu'on souhaiterait qu'elle porte son nom.

A Monsieur Piché et à moi, il a prodigué, sans compter, ses avis précieux, guidant pour ainsi dire nos premiers pas dans la carrière nouvelle, que nous avions, sur ses conseils, embrassée; aussi, sa mort nous a-t-elle été particulièrement pénible, nous a-t-elle profondément affectés.

Cette école, qui lui tenait tant au cœur, elle est née avant qu'il meurt, et il a pu dire avant de s'en aller ces paroles du poète :

'Mes arrières-neveux me devront cet ombrage.'

AVILA BEDARD,

Ingénieur-forestier.

In the death of Mgr. J. C. K. Laflamme, which occurred on July 6 last, the Canadian Forestry Association and the cause of forestry in Canada sustain a severe loss. In the work of the Association Mgr. Laflamme had since 1905 held the position of director, and at the convention in 1906 delivered a paper on 'Forestry Education.' In the propaganda of

forestry Mgr. Laflamme was enthusiastic and assiduous, especially in his beloved native province, and it is a matter of deep satisfaction to his many friends and admirers that he should have lived to see the inauguration of the forestry school which he had so long desired and worked for, and which it has been proposed to name after him.

Mgr. Laflamme was born in 1849 at St. Anselme, P.Q., graduated in arts and theology from Laval University, Quebec, and at the age of twenty-two was called to the chair of natural sciences in his alma mater. The duties of this position he continued to discharge until last year. For several years he had been rector of Laval University. While best known for his work in geology, he was almost equally at home in other sciences and his learning covered a wide range of subjects. His ability and learning were widely recognized. He was a charter member of the Royal Society of Canada and was president of the society in 1891-2. He was also a member of a number of learned societies in the United States, France and Belgium. In 1892 he was named Bishop of Chicoutimi, but declined the office; in 1894 he was appointed by the Pope as Apostolic Prothonotary, the appointment carrying with it the title of Monsignor. He was also a chevalier of the French Legion of Honor.

As regards his qualities as a man and a teacher no better characterization can be given than that penned by his old pupil, the author of the above article: 'Monsignor Laflamme made for himself everywhere, in the bosom of the university, in his own province, in Canada and abroad, a reputation as a

savant and as a virtuous priest. He has added lustre to the university teaching and shown once more that the Canadian clergy know how to add to their virtue intellectual culture. Those who, like myself, knew him intimately and as a professor know how agreeable was his companionship and how captivating his lectures. Realizing that a university professor must not confine himself solely to the studies with the teaching of which he is charged, but must, on the other hand, have general, even universal, knowledge, he interested himself in all the problems which science has proposed and which human intelligence has tried to solve. And it is the extent of his knowledge, as well as the brilliance of his mind, that made his society agreeable and made him sought after by everyone who knew him. He was really born a professor; in a style dispassionate, filled with imagery, alert, bristling with fine points, he knew how to transmit to his students the various branches of knowledge which his constant communion with well chosen books had given him and which he had assimilated with a rare facility and the numerous observations which he had gleaned in the course of his long experience, from his geological courses and his scientific missions.'



Voyageurs en route to Hudson Bay.

United States National Conservation Congress.

A Brief Epitome of the Work of the Meeting at St. Paul.

The second annual National Conservation Congress of the United States was held at St. Paul, Minnesota, U.S.A., Sept. 5-8. The Congress was addressed by many men distinguished in the movement for conservation, including President Taft and ex-President Roosevelt.

The sessions of the Congress were by no means entirely academic. The practical question of whether the state governments or the federal government should control the disposition of natural resources was brought up by some western and southern delegates, and provoked some lively and at times acrimonious discussion. President Taft expressed himself in favor of state control, but Colonel Roosevelt strongly insisted on the control of resources by the nation. Those in favor of national control won, though the resolutions adopted by the convention approved a scheme of co-operation between state and federal authorities.

The chairman at most of the sessions was H. N. Baker, president of the congress, and at some of the meetings it is stated twelve thousand people were present. The delegates were welcomed by Governor Eberhardt of Minnesota.

President Taft.

The great event of the first day of the Congress was the speech of President Taft, who was warmly received. He traced the growth of the conservation idea, paid a tribute to ex-President Roosevelt for his share in promoting it, and voiced his own gratification at his opportunity for carrying it out. Conservation was not a matter of politics, but a business matter affecting every citizen.

The body of President Taft's talk was a review of federal land policies and laws. The lands he divided into six classes, namely, (1) agricultural lands, (2) mineral lands, (3) forest lands, (4) coal lands, (5) oil and gas lands, and (6) phosphate lands. Among other things he recommended the repeal of the Timber and Stone Act.*

*NOTE.—The Timber and Stone Act, passed in 1878, provides that government land deemed unfit for agriculture may be sold at the rate of \$2.50 per acre for the timber and stone thereon. It is claimed that under this Act much valuable land has wrongly passed out of the possession of the United States government.

Touching on the national forests (the present area of which is some 144,000,000 acres) he foreshadowed the addition to them of other forest land now owned by the government and the elimination from the national forests of agricultural land. The losses from forest fires throughout the United States he estimated at \$50,000,000 per year. It was in the power of the state legislatures, he believed, to require the enforcement of regulations in the general public interest as to fire and other causes of waste in the management of forests owned by private individuals and corporations.

State versus Federal Control.

At Monday afternoon's session the chief conflict on the question of federal vs. state control took place.

Federal control was favored by Governor E. F. Noel, of Mississippi, Governor W. R. Stubbs, of Kansas, and Senator Beveridge, of Indiana. State control was championed by Governor E. L. Norris, of Montana, Governor M. E. Hay, of Washington, and Governor R. B. Brooks, of Wyoming. Governor Deneen of Illinois pleaded for co-operation between state and federal authorities.

An exciting five minutes was contributed by Governor Stubbs, who, after Governors Hay and Norris had spoken strongly favoring state control, arose and delivered an impassioned tribute to ex-President Roosevelt and ex-Forester Pinchot.

Senator Knute Nelson.

Senator Knute Nelson, of Minnesota, also addressed the congress on 'The Public Land Laws.' He favored co-operation between the state and the federal authorities in the development of water power under present conditions, where the state owns the water rights and the federal government the site.

Col. Roosevelt.

On Tuesday morning, when Col. Roosevelt addressed the congress, the attendance was even larger than that on the day before when President Taft spoke. Five minutes of hearty cheering greeted Roosevelt on his introduction.

In his speech he emphasized the importance of the lakes-to-gulf waterway. He noted also the fact that the railways controlled the water-front in nearly every city from St. Paul to the Gulf, and urged that a close watch



Cutting Test Trees, Yale Forest School Camp.

be kept on the railways, in order to prevent them from controlling the boat lines; and that adequate terminal facilities be provided in every city on every improved waterway.

He next pleaded that the people should stand at the back of the Appalachian and White Mountain forest reserve movement and ensure the passage of the bill creating them.

The forest fires of the present season proved the need of forest fire protection.

The forest reserves, he reminded the audience, served not only timbermen, but cattlemen, sheepmen and miners as well, and protected the water supply of many towns, as well as that of numerous irrigation and power schemes.

Col. Roosevelt also favored the creation of a country life institute, for the disseminating of knowledge relating to country life, and of a federal bureau of health with the object of minimizing disease and prolonging life.

He noted the failure of the national conservation commission through the lack of Congress to provide funds, and commended the work of the National Conservation Association and of the Congress.

'The most effective weapon against the great corporations will be federal laws and the federal executive' summed up his pronouncement in regard to control of resources. In spite of many misconceptions, conservation was making good progress.

Water-power Monopoly.

Herbert Knox Smith, U. S. Commissioner of Corporations, spoke on the prevention of water-power monopoly. The entire water-power of the country was about 5,300,000 horse power; of this 3,200,000 horse power (three-fifths of the whole) was in the hands of a few capitalists. Four concerns dominated the water-power interests of the United States. One group of capitalists (fifty-three in number) controlled one-fourth of the water-power of the United States. As for remedy the government, he believed, could impose any restrictions it wished. Federal

and state governments must work in harmony and use their full power in regulating the water-power-owning corporations.

Jas. R. Garfield, former Secretary of the Interior, gave a clear outline of what the Roosevelt policies are, and told something of the inside history of the public land laws and of the Roosevelt administration's history and motives.

The remainder of the afternoon session was devoted to a discussion of the respective spheres of the federal and the state governments. The tenor of the discussion was strongly in favor of co-operation between the two authorities.

James J. Hill.

The great address at Wednesday morning's session of the convention was given by James J. Hill, the well-known railway magnate. He spoke strongly in favor of 'state rights.' The mines, he thought, could best be administered by the state authorities, and cited the conduct of the iron mines of Minnesota in support of his view. The forest service also came in for criticism on the ground of excessive expenditure. Water-powers also should form part of the state's capital. Federal control was, in fact, illegal. Administration of public lands by the federal authorities had given rise to far more abuse, proportionally, than state administration.

Mr. Hill devoted a large part of his address to soil conservation. He contrasted European, especially Danish, methods of soil management with methods in vogue in the United States, much to the advantage of the former.

Speaking of 'conservation of capital,' he condemned extravagance in public expenditure, censuring what he considered undue expenditure in the carrying out of work undertaken to conserve resources. In some respects the tariff was an enemy of conservation, promoting the use of home products when imported products could be used just as well, and when their use would save home resources.

On Wednesday evening Frank M. Chapman, curator of birds in the American Museum of Natural History, New York, lectured on 'Practical Bird Conservation.' He spoke particularly of birds as conserving forests through their destroying many of the insects that attacked the trees. What spraying was to orchards, birds were to the forest.

H. S. Graves.

H. S. Graves, Forester of the United States, was the chief speaker at Thursday's sessions. Conservation, he said, had reached a critical point. Everyone now admitted the desirability of it, but when it came to putting conservation into practice, and spending money in carrying it out, whether in public or private business, indifference, and even opposition, came in.

In spite of some increase in lumber prices,

the people at large did not realize the need of immediate action looking to the preservation of the forests, whether for the sake of a future timber supply or with the object of preventing soil erosion and regulating stream flow.

The forest problem was particularly difficult. From forty to one hundred years were required to produce timber, and this meant a long-time investment. By this circumstance and through the risk of fire, burdensome taxation and the present uncertainties of market, few lumbermen were at present practicing forestry. Some method must be devised to remedy this state of affairs. On the individual states rested the first responsibility. Not only was it necessary to appoint state foresters and make forest laws, but these laws must be enforced, a forest fire protection system instituted and a sufficient supply of money appropriated to carry on the work.

The federal government must administer the forest lands held by the nation. This administration must have regard, primarily, to their continued use, rather than to use which will exhaust their resources. The first task was to protect them from fire: first, by building a system of roads and trails, to ensure adequate patrol and easy despatch of men to any part of the reserve where fire happened to be, and telephone lines for quick communication. The second necessity was a well-organized force of rangers and guards for patrol and fire-fighting.

The National Forests were for use and were administered primarily for the benefit of the communities in which they were located. The Forest Service aimed to manage these forests, not only with a view of utilizing the timber and putting it to the best use, but also to make the best use of the other resources of the reserves.

New York Methods.

J. S. Whipple, Forest, Fish and Game Commissioner of New York State, outlined what had been done in his state in the line of fire protection and prevention in the forests, and also in reforestation work. Development and prevention of waste he characterized as the chief principles of conservation.

Franklin McCray, of Indianapolis, held that as many of the land grants made by the United States Government had been secured by fraud, the government should cancel such grants and restore the land to the people.

Gifford Pinchot.

Gifford Pinchot, former Forester of the United States, spoke next and was enthusiastically received. He said the struggle between monopolists of certain resources and the advocates of conservation had been forced by the former. First, last and all the time, the interests of the people must be put ahead of the interests of the few. Natural resources still owned by the people which are necessities of life, such as coal and water-power,

should remain in public ownership and only disposed of under lease for short times and for adequate rentals. Co-operation between states and federal government was a necessity. He went on to outline various lines and methods of work which should be undertaken in the interest of the conservative management of the public domain.

Other Interests Represented.

Among the many others who spoke and their subjects were: W. W. Finley, president of the Southern Railway, 'The Interest of the Railways in National Conservation'; Dr. Franklin L. McVey, president of the University of North Dakota, 'Rational Taxation of National Resources'; Prof. Liberty H. Bailey of Cornell University, 'The Importance of the Country Life Movement'; E. T. Allen, forester, Western Forestry and Conservation Association, 'The Need of Forest Fire Protection'; Alfred L. Baker, Chicago, 'The Stake of the Business Man in Conservation'; Prof. F. L. Westbrook, dean of the Medical College of Minnesota, 'Life and Health as National Assets'; Mrs. Matthew T. Scott, president of the Daughters of the American Revolution, 'Conservation True Politics'; Francis J. Heney, San Francisco, 'Safeguarding the Property of the People.'

Officers Elected.

The election of officers took place on Thursday evening and resulted as follows:—

President—Henry Wallace, Des Moines, Iowa.

Executive Secretary—Thos. R. Shipp, of Indianapolis, Ind.

Corresponding Secretary—Jas. Gipe, of Indianapolis, Ind.

Treasurer—D. Austin Latchaw, of Kansas City, Mo.

Vice-Presidents were also elected, one from each state.

Mr. Jas. White, F.R.G.S., F.R.S.C., Ottawa, secretary of the Commission of Conservation, represented the Commission at the congress.

Resolutions.

Resolutions were submitted and passed:

- (1) endorsing Mr. Roosevelt's contention that all the waters are the property of, and should be administered by, the whole people;
- (2) favoring the treatment of each stream as a separate unit, all cases of doubtful or divided jurisdiction to be administered by federal and state authorities in co-operation;
- (3) holding the primary uses of water to be for domestic purposes and for irrigation, navigation and power to be secondary uses, the proper use of any water to be determined on the principle of the greatest good to the greatest number;
- (4) urging on all those in control of water the

- duty of purifying and keeping pure the water supply for domestic purposes;
- (5) commending the reclamation service, urging its continuance and the extension of the reclamation policy to the drainage of swamp and overflowed lands;
 - (6) approving the adoption of a comprehensive plan of river and lake navigation throughout the United States;
 - (7) favoring federal control of water-power, denying the right of any government to grant water franchises in perpetuity and demanding that use of water rights be allowed only for limited periods and in return for adequate compensation to the people;
 - (8) demanding the maintenance of a federal commission to control the waters;
 - (9) approving the withdrawal from settlement or sale of public lands pending classification and the separation of surface rights from mineral, forest and water rights, recommending legislation for classifying and leasing of grazing lands within reserves, arid and non-irrigable grazing lands to be administered by the government in the interest of small stockmen and homeseekers until they have passed into the hands of actual settlers;
 - (10) holding that mineral deposits on public lands should be leased for limited periods (maximum, 50 years), the royalty to be adjusted at still more frequent intervals, phosphate deposits to be safeguarded for the people;
 - (11) recommending the early opening up of Alaskan coal-fields under a system of lease from the government, urging investigation by the federal government of damage due to copper ore smelting and of the feasibility of using by-products of phosphate fertilizers and favoring co-operative action of state and federal governments to secure improved soil management methods;
 - (12) approving the control of national forests by the federal government, lands more valuable for agriculture than for forestry to be opened for homesteading, and recommending the acquiring by state and federal governments of waste land for reforestation and the protection by the governments of all forests;
 - (13) commending the work of the Forest Service and recommending its still more liberal support, the extension of the fire patrol system and the employment of federal troops in case of emergency;
 - (14) favoring the repeal of the Timber and Stone Act;
 - (15) endorsing the Appalachian and White Mountain forest reserve;
 - (16) recommending bird and game protection;
 - (17) recommending the teaching of the principles of conservation in schools;
 - (18) recommending greater attention to the

- promotion and protection of the public health and the prevention of child labor;
- (19) recommending legislation to promote the use of proper safeguards to life in transportation and mining operations and the establishment of a federal department of public health;
 - (20) recommending the maintenance of a federal conservation commission and the establishment and maintenance of state conservation commissions.

DEATH OF PROF. S. B. GREEN.

Sincere and widespread is the regret felt among students and advocates of forestry at the death of Prof. S. B. Green, Dean of the College of Forestry of the University of Minnesota, which occurred on July 11 last. Prof. Green was one of the first advocates of forestry on this continent, and was ever active in the promotion of the science. He was a graduate of Massachusetts Agricultural College, specializing during his course in horticulture and forestry, and afterwards continuing his studies in these subjects in various foreign countries. In 1898 he was appointed to a professorship in the University of Minnesota. Years of patient work built up the department of forestry in the university until it grew to be a third of the Agricultural College, and finally, on May 13 last, it was constituted a separate college of the university and Prof. Green was appointed its Dean. In addition to his work in the teaching of forestry, he had many other interests. He was professor of horticulture in the State Agricultural College, President of the Minnesota Horticultural Society, a member of the State Forestry Board, and took a prominent part in the work of the Farmers' Institutes of the State. He is the author of several works, the best known to foresters being his 'Essentials of American Forestry.' His death will be deeply felt as a loss to the state, the nation and the forestry and lumbering interests.

WILL TEACH FORESTRY IN B.C.

The report of the commission appointed by the British Columbia government to select a site for a provincial university has lately been presented to the Lieut.-Governor-in-Council and recommends the location of the university near Vancouver. In an auxiliary report addressed to the minister of education the commission suggests that not less than 700 acres be set aside for experimental purposes in agriculture and forestry. This is exclusive of a forest reserve for forestry operations on a large scale.

Earl Grey's Hudson Bay Trip.

Public Attention Directed to a New Part of the Dominion.

His Excellency, the Governor-General, commenced his trip to the Hudson Bay regions (referred to in the last issue of the CANADIAN FORESTRY JOURNAL) on August 3, when he and his party, which, as far as Norway House, included Lady Grey and Lady Evelyn Grey, left Winnipeg for Selkirk. Leaving Selkirk on the afternoon of the fourth of the month, Lake Winnipeg was crossed and Warren's Landing, at the outlet of the lake, reached on the morning of the sixth. Then, crossing Playgreen lake in a motor-boat, Norway House was reached in the afternoon of the same day.

The party received a hearty welcome at Norway House, and here Lady Grey and Lady Evelyn Grey turned back. On the afternoon of Aug. 8 a start was made from Norway House, the party with attendant members of the N.W.M.P. and Indian canoe-men and guides occupying twelve canoes.

On the morning following they turned into Hairy Lake, and then up the Echimamish river, a tributary of the Nelson, making camp for the night on that river. On the morning of the tenth the expedition portaged over to the Hayes river.

Late on the evening of the twelfth, Oxford House, at the head of Oxford Lake, was reached—the only settlement between Norway House and York Factory, which are four hundred miles apart.

For five days, from the eleventh to the fif-

teenth, the party passed through an endless series of reedy islanded lakes and lovely rivers, their low banks covered with the characteristic and rather valueless timber of this region, mostly spruce, poplar and tamarac.' After leaving Oxford House, bad weather was encountered on the evening of the fifteenth and the sixteenth, which delayed the party for somewhat over a day. This was on Swampy Lake.

On the seventeenth a new stage of the journey began, the river descending rapidly from here to Hudson Bay, up to the final hundred miles of 'even, broad and rapid water through high clay banks covered with scrubby spruce.'

York Factory was reached on the evening of August 19. There the steamer Earl Grey had been waiting for some days, having left Pictou, N.S., on August 3.

The party spent the twenty-second in visiting Fort Churchill, and then the route lay across the bay, through the strait and down the Labrador coast. The mouth of the Humber river, Newfoundland, was reached on September 3—just a month after leaving Winnipeg.

Earl Grey's trip cannot but have an important effect in directing public attention to the products of the region traversed, the means of access, feasibility of commercial routes through the region and the resources of the area generally.

FOREST FIRES IN ALBERTA.

While fire losses throughout the western part of this country have been eclipsed by the awful disasters in Idaho and Montana, the situation in the foot-hills of the Rockies in Alberta was for some time a serious one. Conditions throughout the west during the past season have been exceptionally favorable to the starting of serious fires. The exceptionally dry autumn of 1909 was followed by a winter of but slight snow-fall. The snow, when it melted, sank right into the ground, and the consequent dryness of the forest-floor was much increased by the abnormally dry spring. Conditions were ideal for the fires, and serious fires were practically unavoidable. Fires are reported to have done much damage near Morley and High River. Mr. R. H. Campbell, Superintendent of Forestry, who is at present in the west, intends to make a thorough investigation of these fires before returning.

FOURTH CANADIAN IRRIGATION CONVENTION.

The fourth annual convention of the Western Canada Irrigation Association was held in Kamloops, B.C., August 3 to 5. Many excellent addresses and papers were given, and the programme also included a twelve mile trip up the Thompson river, where the results of irrigation in British Columbia were presented to the eyes of the delegates. It was resolved to meet next year in Calgary. The following are the officers for 1910-1911:—Hon. President, His Honor Lieut.-Gov. Bul-yea, Edmonton, Alta.; President, Wm. Pearce, Calgary, Alta.; 1st Vice-President, F. J. Fulton, Kamloops, B.C.; 2nd Vice-President, R. R. Jamieson, mayor, Calgary, Alta.; Treasurer, C. W. Rowley, Calgary, Alta.; Executive Committee, C. W. Peterson, Calgary, Alta., W. H. Fairfield, Lethbridge, Alta., Horace Greely, Maple Creek, Sask., Dr. Chas. W. Dickson, Kelowna, B.C., R. H. Agur, Summerland, B.C., and R. M. Palmer, Kamloops, B.C.

Ontario Forest Fires of the Past Summer.

Many Towns Threatened and Much Property Destroyed.

The forest fires of the fore part of the past summer will make the season memorable to the residents of Fort William, Port Arthur, Rainy River, Fort Frances and other towns and districts of the western part of New Ontario. Many rural dwellers lost crops, buildings and other possessions, in some cases all they had, and even some of the towns were in peril, help in one instance having to be summoned from Winnipeg.

The fires of the early part of June (noted in the June number of the CANADIAN FORESTRY JOURNAL) showed no abatement during the latter part of the month. The weather continued dry, the only rains that came being very light. The force of fire rangers was greatly increased, whole train loads being despatched to some danger points. The losses were confined, according to Hon. Frank Cochrane, almost wholly to limit-holders and settlers, little of the provincial land having been burned over. Many limit-holders suffered severely. According to reports received at the provincial department of Lands, Forests and Mines, Toronto, the fires were almost invariably caused by railways.

The first of July found the village of La-vallee in great danger. At the request of the inhabitants of the village, the town of Fort Frances sent down a fire engine to protect the buildings. The women and children were sent to Fort Frances, the contents of the houses packed in box cars ready for removal, and the men of the place joined the railway section gangs in fighting the fires. The fire was finally fought off.

At Devlin much loss was caused the provincial government of Saskatchewan, which lost a great many telephone poles that were piled there, and to the Canadian Northern railway company, which lost several thousands of poles and ties and a large quantity of cedar poles. The hotel and station were burned, also a sawmill and the schoolhouse.

Throughout the townships of Burriss, Dance and Crozier, there were many fires, and the village of Stanley had a narrow escape. Silver Mountain, twenty miles from Fort William, also reported large fires. The village of Emo was also threatened, and several construction camps were consumed.

The Canadian Northern Railway is reported to have lost a hundred boxcars and a number of stations throughout New Ontario, besides many water tanks and other buildings.

Along the line of the Algoma Central railway half a dozen construction camps and large quantities of explosives and supplies were consumed. Residents in O'Connor and Conmee townships, according to returns furnished by forest rangers, lost in the aggregate over \$20,000.

In the Nipigon reserve a good deal of loss was caused by the carelessness of laborers on railway construction. As the flies were troublesome, many 'smudges' were lighted to keep them off, and quite a number of the 'smudges' developed into serious fires.

A telegraphic despatch stated that about a hundred miles west of Cochrane a construction camp on the Grand Trunk Pacific Railway was burned on July 10, and the men had to take to the Vallentyne (?) river and stand up to their necks in water to save their lives.

During the third week of the month, Kenora became a fire centre, though the fires did not result very seriously. Fires were reported on the west bank of the Winnipeg river, north of Keewatin, considerable timber being destroyed. On the afternoon of the 30th a settler near Osterson, who was fighting fire, was unable to check it, and had, with his wife and children, to get into a near-by lake in order to preserve their lives. About a week later, at Keewatin Beach, a summer resort near Kenora, two cottages were destroyed by a fire which caught from the woods, and some children with their nurse had a narrow escape.

The worst fire of the month, however, occurred at Rainy River on July 21 and 22. During the two days the town was in imminent danger. For a distance of two miles on the north side of the town only the main track of the Canadian Northern Railway separated it from a fiercely burning tamarack forest. At four p.m. on July 22 the wind changed and the town was relieved. Assistance was summoned and received from Fort Frances, Beaudette (Minn.), Kenora and Winnipeg. Backfiring was successfully resorted to in order to save the Canadian Northern railway station and roundhouse. The Rat Portage Lumber Co.'s mill was in great peril and was saved only by the efforts of a large number of men. Fortunately a heavy rain came on July 23 and the following days, extinguishing the flames.

The Season's Forest Fires in the United States.

Heaviest Losses since the Settlement of the Western States.

Losses from forest fires during the past summer in the Lake States and the 'Inland Empire' (Washington, Oregon, Idaho and Montana) have been the severest for many years, probably the severest since the settlement of these states.

The month of July was the disastrous one for the Lake States. Several towns and villages were destroyed, among these being Buswell, Mich. (loss \$285,000), Blount and West Turner, Mich., Heinemann, Wisc., and Mizpah, Minn. Many of the fires assumed immense proportions. Near Wausau, Wisc., the fire was said to have a front of ten miles, while in Ontonagon county, Mich., a fire was said to have a width of five miles.

Among the vast losses caused, there have been given the following in Wisconsin:—Pine timber north of Chippewa Falls and Eau Claire, \$1,000,000; Wisconsin Central R. R., \$200,000; companies operating from Marinette (northern Wisconsin), Wausau and Rhinelander, \$1,500,000; Washburne and territory north of Ashland and towards Superior, \$500,000,—a total of \$3,200,000. A district fifty miles north of Prentice, Wisc., and forty miles wide, is reported to have been burned over. Fire in the Huntington forest reserve in the same state is reported to have done \$500,000 damage. In Menominee county, Mich., the loss was estimated at from \$200,000 to \$300,000. Heavy damage was done near Bemidji, Minn.

In the Northwest the fires had already begun to be serious in the first half of the month of July, thirteen fires being reported to be in progress in western Montana on the fourteenth of the month. A Vancouver despatch of July 20 reported that two hundred and fifty miles of forest were being burned over in northern Idaho and the Western Kootenay district; fifty lives had been lost, six towns burned and miles of railways destroyed. Spokane, under the same date, reported that the fire had covered a tract of territory fifteen miles long and seven wide, and millions of feet of timber had been destroyed. Three thousand men were engaged fighting the fires. Three men lost their lives on July 20 on the Santine river.

It was not until about a month later, however, that the fires reached their worst. By the twelfth of August the fires had increased to such an extent as to threaten the towns of Wallace, Mullen and Burke, Idaho. At Mullen burning limbs of trees a foot and a half long were reported to have been carried three miles into the town. All the male

inhabitants were busy fighting the fires, and in response to a request soldiers were sent to aid the fire fighters. In the case of Wallace, however, the efforts were without avail, and the fire reached the town and burned the east half, with a loss of thirteen lives and a property loss of \$1,000,000. The towns of Taft, Deborgia, Henderson and part of St. Regis were also reported burned. The people of Wallace were conveyed in special railway trains to Missoula, Montana.

On August 22 Tacoma, Wash., was reported to be in danger from bush fires, but by the following day the danger was over.

The town of Elk City, Idaho, was in danger, but the women guarded the buildings while the men were fighting the fires farther out, and the place escaped.

On August 23 the first Northern Pacific R. R. train for three days reached Helena, Mont.

Almost the whole of the Coeur d'Alene region was reported to be in flames. The valleys of the St. Joe and St. Mary rivers suffered especially. Desperate efforts were made to fight the fires, and many of the fire-fighters lost their lives. To the very strenuousness of the effort, indeed, much of the loss of life may be attributed.

Estimates of the loss of life vary widely. Fifty deaths seems to be the lowest estimate, while other estimates run as high as a hundred and fifty and even two hundred. It seems very probable that the exact number of those who lost their lives in the fires will never be known.

The loss of timber, it is estimated, may reach 750,000,000 feet. In the Coeur d'Alene region, it is said, the loss may run as high as 500,000,000 feet. Another estimate of the timber loss gives 3,000,000,000 feet.

The fires were finally checked by falls of rain and snow during the last few days of the month. The property loss has been enormous. Not only have millions of dollars' worth of standing timber been destroyed, but millions more have been lost through the destruction of the various towns, settlers' buildings, crops and improvements, mine buildings, etc.

The giant sequoias in the Sequoia National Park, California, were thought to be in danger of being destroyed by fire at one time in the early part of July, owing to large forest fires in their vicinity. The fires were finally controlled and the big trees saved.

The Spruce Budworm.

An Account of the Work Being Carried On.

On applying to Dr. C. Gordon Hewitt, Dominion Entomologist, as to the work that the Federal Department of Agriculture were doing in regard to the Spruce Budworm (*Tortrix fumiferana*), he made the following statement to the Canadian Forestry Association:

'The attention of the Department was first called to serious attacks of this insect in the upper Gatineau region of Quebec by the Hon. W. C. Edwards. Mr. Arthur Gibson, Chief Assistant Entomologist of the Division of Entomology, was immediately sent to investigate the outbreak in July, 1909, and he has already communicated an account of his investigation to the CANADIAN FORESTRY JOURNAL (Dec. 1909).

'In October, 1909, a few weeks after taking charge of the work of the Division of Entomology, I visited British Columbia and investigated the attacks of the insect on Vancouver Island. The serious character of the attack of the Spruce Budworm on the balsam and spruce in Eastern Canada and the Douglas fir in British Columbia, rendered a careful study of the insect, its depredations and controlling agencies imperative, and accordingly such a study was commenced. During the present summer (1910) the line of investigation that we have been following has been to discover the species of parasites attacking the pest. In the case of an outbreak of this nature, when the insect has gained great headway before its discovery, and where it is impracticable to adopt any means of control, the most important and only line of investigation possible is a study of the species of the parasites, which are the natural means of control, attacking the caterpillars, with a view to discovering: first, what species there are, and secondly, whether they are increasing in number. This information is of very great importance and value, not only from a scientific but also from a practical point of view, as the following instance of a similar study will show. In England, a serious outbreak of the Larch Sawfly was reported in 1906. (This is the same insect which destroyed all the larch or tamarack throughout Eastern Canada some years ago, and again appeared about five years ago.) In the following year I began to study the life-history of the insect and its parasites. Except in newly planted areas it was not possible to adopt any means of control. It was found in 1908 that a certain species of ichneumon fly, an important parasite, had killed about six per cent. of the insects; in the following year the percentage killed had increased to about twelve per cent. I then left England and came to Canada, but to continue the investigation many thousands of the cocoons were im-

ported from England, and this year I found that the percentage of insects in the cocoons killed by the parasites was *over 60 per cent.* This discovery, which was also confirmed in England, is of the greatest interest and importance as it indicates that in those localities, where the infestation was most serious the parasites have almost gained complete control of the sawfly, and control will mean eradication. The practical value of this continued study lies in the fact that the owners of timber feared its destruction by the continued defoliation by the caterpillars, many acres having been so killed, and were cutting down timber before it had reached its full growth and value to save it. This will now be unnecessary, as we know the pest will be controlled by its parasites. In a similar manner we have already begun a study of the parasites of the Spruce Budworm, and we hope, next year, to study the percentage of the caterpillars attacked by the species of parasites that we have bred from them during the present season. It is expected that such an investigation will indicate to us the extent to which natural means of control are acting upon the pest, and until we have such information it is impossible to prophesy what the results of the outbreak will be and whether considerable loss will be caused or not before the pest is controlled by these natural agencies.

'I have conferred with Mr. G. C. Piché, the Chief Forestry Engineer of the Province of Quebec, and with the Hon. W. C. Edwards and others who have interests in the forests at present attacked. It has been decided that the area over which the outbreak extends at the present time shall be delimited and Mr. Piché has arranged for such a survey which I believe is now in the field. When this survey is complete Mr. Piché and I intend to visit the worst infested regions, and it is proposed to elucidate certain points with regard to the life-history and habits of the insect, and the visit will enable us to determine, so far as is possible, to what extent the trees have been injured by the previous depredations. It will be possible, also, to discover whether the trees, weakened in vitality by the defoliation by the caterpillars, are being attacked, as is often the case, by species of bark-beetles which complete the destruction of the living tree.

'The Association may be assured that we are giving this serious matter our most careful attention, and we hope that next year, when the parasitic work is continued, that those concerned will assist us in obtaining supplies of material to enable us to make our investigation as complete as possible.'

Forest Fires in British Columbia.

Much Damage Done in the Kootenay District and Around Vancouver.

By far the most serious of British Columbia's forest fires of the past summer have occurred in the Kootenay district. In the immediate vicinity of Nelson a fire started about July 8. It is supposed to have been caused by fishermen. It required the services of a hundred and fifty men for some time. On the fifteenth the fire was burning on the slope back of the town, but was extinguished by a force of men sent out by the government agent.

During the same week occurred a fire at Tahon, which spread from clearing land. A fire at Shore Acres, which started from the same source, kept thirty men busy for some time. Up to July 22 the air in Nelson was heavy with smoke. On that day a brisk fire was in progress at Hall's Siding, a few miles from the town. Most of the fires in that vicinity were by that day reported under control.

Early in the month much loss was reported from a fire at Galena Bay, where the Arrowhead Lumber Co. was reported to have lost considerable timber and some camps and equipment. In one case, a hundred and sixty men were on the ground fighting fire within twenty minutes of the time the alarm was given.

On July 15 there were serious fires to the south of Moyie. The Consolidated Mining and Smelting Co. near Moyie was a loser to the extent of \$40,000, three miles of their flume, poles, etc., being destroyed. Two hundred fire-fighters were employed. Rains about a week later finally disposed of the fire.

On July 13 despatches reported that at Kaslo practically the whole mountain side was in flames. The fire had originated from boys smoking. At Whitewater the fire made a clean sweep of the town, even the tree-stumps being burned up. The bridges on the railway for a distance of five miles were burned. All the people of the burned town were removed to Kaslo. At McGuigan all buildings were destroyed, and the Great Northern Railway lost a number of freight cars, bridges, etc. Three hundred miners and their families were left homeless. The loss of timber was given as \$100,000.

The worst disaster of the season occurred at the Lucky Jim mine, where five men lost their lives. One of these, Chas. Norman by name, was apparently overcome while looking for a companion in order to try to save him. Norman had previously warned many miners in their cabins of the impending danger. The buildings of the Rambler mine were also destroyed. Back-firing had finally

to be resorted to. The fire seems to have entered the district by Bear Creek near New Denver.

The town of Scandinavia was in great danger. The flames got within a mile of it but were beaten back. A force of seven hundred fire-fighters was employed at one time. Much timber, many fields of standing crops, and many ranch buildings were destroyed.

At New Michel a fire started back of the Great Northern Railway round-house, supposedly from a workman dropping a lighted cigarette. The fire is said to have gone, in twenty minutes, a distance of a mile. The best piece of timber left in the neighborhood was burned up. The fire subsequently spread to the mountains, and much valuable timber was consumed. This included a million feet of logs piled on the limits of the New Michel sawmill near Phoenix.

A costly fire also occurred at Arrow Park, some valuable timber being destroyed and many ranchers losing everything they owned. Fire at Big Bend, near Revelstoke, did much damage to the Canadian Pacific Railway, and trains were delayed.

Around Fernie the losses were not large, the most serious being the burning of some three million feet of logs skidded at the old site of the East Kootenay Co's mill, a few miles west of Cranbrook. On July 23 heavy rains came and most of the fires were extinguished.

In the vicinity of Vancouver, too, the early part of the month saw many forest fires. On Sunday, July 10, eight fires were known to be burning near the city. Ashes fell in the city streets and there was a great deal of smoke. The most serious fire burned over the Lynn valley, on the north side of Burrard inlet. The Hastings Shingle Mill Co. had its flume demolished and 2,000 cords of shingle bolts destroyed. The North Vancouver waterworks intake buildings were threatened, but two hundred fire-fighters succeeded in controlling the fire.

Fires also occurred at Lake Buntzen and Harrison lake, the latter, however, not being serious. Both were caused by donkey engines. At Lake Buntzen the engine was being moved, when it struck a stump, and the ash box was knocked off. Fire started from the cinders, and, in spite of the efforts of a large corps of men, covered more than two square miles of territory.

The loss from fires throughout the province was put by various estimators at from two million to three million dollars. Chief Ranger W. C. Gladwin, however, reported to Premier McBride that \$357,000 would

cover the loss, viz., \$40,000 for the timber destroyed and \$317,000 for damage to improvements.

During the month 401 fires were reported to the provincial authorities. The government's expenditure for fighting forest fires amounted to \$40,163.53, and private expenditure amounted to about \$20,000 more. This, of course, takes no account of damage to young growth, soil, etc. It is reported that a large percentage of the fires were thought to be started by railway locomotives. Ninety-five per cent. of the fires were extinguished before they became serious. Eight lives were lost, two of them by falling trees. Crown timber sustained little damage. The fires for the most part ran over lands already cut over.

August.

This month was comparatively free of fires. A number were reported on Vancouver Island. One on the Saanich peninsula had (Aug. 10) been burning for weeks. At Salt Spring Island and along the Eastern and Northern Railway fires were also reported. On Aug. 7 Eburne, a suburb of Vancouver, was threatened, but the fire was soon checked.

On Aug. 20 the people of Corbin had a hard day watching and fighting the fire which had got dangerously near one part of the town. A large fire was reported to be burning on Baker Mountain, east of Cranbrook, and fire was burning between Fernie and Hosmer. No towns were endangered but considerable timber was damaged.

On Aug. 25 two hundred acres of bush near White Rock station on the Great Northern Railway, near the International boundary,

were burned over, the fire starting from clearing land. In fact the residents of the place were kept on the alert for a couple of weeks to save their places from the fire.

Around Nelson smouldering fires were roused and caused considerable trouble. The smoke on the lake was so dense that the pilots of steamers and other craft had to trust to the compass for their direction.

Chief Fire Warden Gladwin reports that in August the loss from fire was smaller than in July, but that the cost to the government for fire protection was greater. A total of 3,572 men was employed at a cost of \$40,669.50. The government saved a vast amount of timber and other property, including eleven sawmills, and their cut of 17,000,000 ft. of lumber and timber limits estimated to contain 2,500,000,000 feet of standing timber. The fires numbered 325.

September.

The middle of September saw an extensive fire in cut-over lands, chiefly in the municipality of Surrey, a short distance south of Vancouver city. The fire covered a strip from two to seven miles wide, which started from two miles west of Cloverdale and extended within two miles of Crescent. A sawmill at Hazelmere was burned, as well as many settlers' buildings. Large timber seems to have escaped. The total loss was given as about \$15,000.

The Great Northern railway had a number of bridges burned, and trains to Vancouver had to be sent around by Sumas. The fire started on a ranch and was smouldering some two weeks before it broke out. Hard work finally brought it under control.

THE ANNUAL REPORT.

The annual report of the Association for 1910 has been issued and should have reached all members long before this. If any have not received it the Secretary will be obliged for this information, and a copy will be sent immediately. As the mailing list is now revised at frequent intervals, it is no trouble to insert a change of address, and if the present address on publications reaching members is not correct it will be a kindness to the officers to let the Secretary have the new one.

The report in French is now in the hands of the printer. Last year there was an issue of 2,000 copies, and these were all promptly distributed. Will those who would like to receive a copy of this report kindly notify the Secretary as early as possible, so that a sufficient number may be printed? This report, like the other publications of the Association, is of course free to members, and for sending to those likely to become interested in the cause.

GETTING FIRST-HAND INFORMATION.

Hon. Frank Oliver, Minister of the Interior, spent his 'vacation,' comprising the month of July and a large part of August, in a trip down the Athabaska, Slave and Mackenzie rivers to the delta of the Mackenzie, thence up the Peel river and down the Yukon to Dawson City and on to Vancouver. The route followed was largely that taken by Mr. E. Stewart, then Superintendent of Forestry, in 1906. The minister made close observations throughout the trip with regard to the people, crops grown, natural gas, oil and other minerals, game and other products of the region.

Secretary's New Address.

The office of the Secretary has been moved to Ottawa, so that all the executive officers of the Association are now in the Dominion capital. The address, to which all communications should be sent, is: Canadian Forestry Association, Canadian Building, Ottawa, Canada.

FORESTRY BRANCH FIELD WORK.

The Forestry Branch of the Department of the Interior has, this summer, eight parties in the field. Two of these are working in the newly created forest reserve on the eastern slope of the Rockies, two in the British Columbia Railway Belt, and four in the Hudson Bay district.

The two parties that are working on the eastern slope of the Rockies have instructions to make a rapid survey or 'reconnaissance' of the region, covering as much of it as can be done consistently with good work. One has been working southwards from Calgary, the other northward.

Large areas have no doubt been burned; these areas it will be their duty to map with as much accuracy as time will permit. They will also report on the tree species, the size and density of the growing timber, the park lands and various other features.

The work of the British Columbia parties is of an essentially different character. There has been included in the timber berths a good deal of land that is of considerable value as farm land; especially in the river bottoms is this the case. The work of these parties consists chiefly in the examination of such land so as to determine what land is unfit for agriculture and should be reserved and what land can properly be thrown open for farming.

Each of the above parties consists of a forester-in-charge, three assistants and a cook.

The work of the Hudson Bay parties is of still another character. There are four of these parties, each consisting of two men. Of these men, some are trained forest engineers; others are experienced timbermen and travellers.

Two of the parties went in by way of 'The Pas' where the C.N.R. line to Hudson Bay at present ends. One of these made at once for Split Lake. The other party started its inspection at The Pas and proceeded down the Nelson river.

The other two parties went in via Norway House, at the north end of Lake Winnipeg. Oxford House is headquarters for one of these, and its members are proceeding to inspect the timber around Hayes river, God's lake, Fox river and other streams, reaching up to York Factory. The other party is proceeding from Oxford House to Split Lake, inspecting the timber along the route.

In addition to inspecting the timber, all four parties have instructions to keep a sharp lookout for forest fires, and have authority to appoint and employ fire rangers where they think it necessary.

Two of these parties (probably a third) will winter in the territory they traverse, so as to be on the spot, ready to continue operations next spring.

ALBERTA FIRE PATROL.

Interviewed by the Calgary News, Mr. D. B. McDonnell, of Winnipeg, spoke very highly of the system of fire patrol maintained by the Forestry Branch of the Department of the Interior along the line of construction of the Grand Trunk Pacific Railway from Edmonton to Wolf Creek. 'There are enough rangers to cover the entire line of grade daily,' he said, 'and they ride back and forth over the country meeting at fixed points. Already they have been instrumental in extinguishing a number of fires which, if not taken in hand at the right moment, would have spread with disastrous results.' Mr. McDonnell, who is a representative of the T. A. Burrows Co., had just returned from a trip of inspection of limits of that corporation on the Athabaska, Brazeau, Macleod, Pembina and Saskatchewan rivers. In speaking of the timber resources of the country through which he passed, Mr. McDonnell said that the settlers who are gradually getting in there seem very anxious to preserve the timber, and that whenever a fire threatens they turn out and fight it to a man. 'They realize the value of the timber and the scarcity of it,' he said, 'but it is practically impossible for them to cope with the situations that arise at times in places remote from the railway, and I think that a larger force of fire rangers in these districts would undoubtedly result in a saving of many thousands of dollars worth of timber annually.'

CANADIAN FORESTRY ASSOCIATION.

The objects of this Association are (1) the preservation of the forests for their influence on climate, fertility and water supply, (2) the exploration of the public domain and the preservation for timber production of lands unsuited for agriculture, (3) the promotion of judicious methods in dealing with forests and woodlands, (4) reforestation where advisable, (5) tree-planting on the plains and on streets and highways, and (6) the collection and dissemination of information bearing on the forestry problem in general.

YOU are directly interested. YOU are a user of wood in some form or other. YOU pay more for that wood than you did ten years ago. YOU or your successors will pay far more in future unless the forests are properly cared for.

The Association is trying to bring about that better care, and your assistance will be appreciated. The membership fee is \$1 per year; \$10 secures life membership. Address your application to the

Secretary Canadian Forestry Association,
Canadian Building,
Ottawa, Ont.

Canadian Forestry Journal

VOL. VI.

DECEMBER, 1910

No 4.



His Excellency the Governor-General, who will open the Convention.



Rt. Hon. Sir Wilfrid Laurier, who has called the Convention.

CANADIAN FORESTRY CONVENTION, QUEBEC, P.Q., JAN. 18 TO 20, 1911.

Preparations for the convention are now in an advanced stage, and a large and enthusiastic gathering is expected. The official call to the convention, issued by Sir Wilfrid Laurier, will be found on page 97, and the provisional programme on page 123 of this number. The sessions of the Convention will be held in the Chamber of the Legislative Council, Parliament Buildings.

Canadian Forestry Journal

The official organ of the Canadian Forestry Association. A magazine devoted to the interests of forestry and in general to the advocacy of the wise and conservative use of the natural resources of Canada.



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The Canadian Forestry Journal is a good advertising medium.

Advertising rates on application.

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Canadian Forestry Journal

VOL. VI.

OTTAWA, DECEMBER, 1910

No. 4

The 1911 Forestry Convention.

CITY OF QUEBEC, JAN. 18-20.

The Official Call Issued by Sir Wilfrid Laurier.

Office of the Prime Minister of
Canada, Ottawa, Dec. 8, 1910.

To the Citizens of Canada:

In the year 1906 the increasing necessity of inducing the people to take action to prevent the rapid destruction of the forests by fire and improper cutting led to the calling of a Dominion Forestry Convention in Ottawa. This Convention which was largely attended by representative citizens resulted in greatly increased interest in this most important subject, with very beneficial results.

The period since then has witnessed a great increase in the interest in forest conservation on this continent. Not to mention what has been done in the United States a great step forward has been taken in Canada by the establishment of the Commission of Conservation. The scope of the Forestry Branch of the Department of the Interior has been much widened and a number of forest reserves have been set apart in the prairie provinces. The most notable is the reserve covering the eastern slope of the Rocky Mountains, formed in order to protect the rivers and the agricultural lands of Alberta and Saskatchewan. In the various provinces reserves have been set apart, timber surveys made, improved fire ranging and timber cutting regulations adopted and

Cabinet du Premier Ministre du Canada, Ottawa, 8 décembre 1910.

Aux Citoyens du Canada:

Dans le cours de l'année 1906, le besoin se faisant impérieux d'engager la population à enrayer le ravage des forêts par le feu et leur déboisement irrationnel, provoqua la convocation d'une Conférence Forestière Canadienne qui se tint à Ottawa. Cette conférence, à laquelle assistèrent un grand nombre de personnalités officielles, donna un vif regain d'intérêt à cette question extrêmement importante et produisit d'excellents résultats.

Depuis, l'on a porté beaucoup plus d'attention à la conservation des forêts sur ce continent. Sans énumérer les mesures prises aux Etats-Unis, un fort mouvement a été effectué au Canada par l'institution de la Commission de Conservation. Le champ d'action de la division forestière du Ministère de l'Intérieur a été élargi, et, dans les provinces des prairies, un certain nombre de réserves de forêt ont été établies, notamment sur le versant oriental des Montagnes Rocheuses, afin de protéger les cours d'eau et les terres arables de l'Alberta et de la Saskatchewan. Dans les diverses provinces, des réserves ont été mises à part, des relevés du bois marchand ont été dressés, la police des feux et la coupe du bois ont été plus minutieusement réglementées, et des écoles ont été

schools for the training of forest engineers established.

Gratifying as this progress has been, the growth of the need for enlightened action has been even more rapid. The increasing value of waterpowers, the dangers confronting inland navigation, the realization of the asset which the country has in its forests as hunting grounds and health resorts, and the increasing scarcity of forest products, all show the need of further knowledge and increased vigilance.

To provide for the discussion of these matters with a view to the adoption of improved methods and the better and more enthusiastic enforcement of existing regulations, I hereby call a public convention to meet in the City of Quebec on January 18, 19 and 20, 1911, under the auspices of the Canadian Forestry Association. To this Convention are specially invited:

Lieutenant Governors of the Provinces,
 Members of the Senate,
 Members of the House of Commons,
 Members of the Legislative Councils and
 Legislative Assemblies of the Provinces,
 Dominion and Provincial Forest Officials,
 Officers and members of the Commission
 of Conservation,
 Members of the Canadian Forestry Association,
 Members of the Canadian Society of Forest
 Engineers,
 Members of the Canadian Bankers' Association,
 Members of the Canadian Manufacturers' Association,
 Members of Lumbermen's Associations,
 Representatives of Boards of Trade,
 Representatives of Railway Companies,
 Representatives of Universities,
 Representatives of Agricultural Colleges,
 Representatives of Farmers' Institutes,
 Representatives of the Canadian Press Association,
 Representatives of Canadian Clubs,
 Representatives of Horticultural Societies,
 Representatives of the Canadian Society of
 Civil Engineers,

instituées pour la formation d'ingénieurs forestiers.

Les bons effets de ce mouvement progressif ont rendu plus urgent encore le besoin d'une action raisonnée. La valeur acquise des pouvoirs d'eau, les périls auxquels la navigation intérieure est exposée, le bénéfice de la richesse que les bois fournissent au pays par leurs domaines de chasse et par leurs villégiatures, la rareté de plus en plus sensible des produits de la forêt, tout fait voir la nécessité de nous éclairer davantage et de redoubler de vigilance.

Afin de préparer le débat de ces questions dans le dessein de faire adopter un mode d'action approprié et de faire observer avec plus de spontanéité et d'efficacité les règlements qui existent déjà, je convoque par la présente une convention publique qui se tiendra dans la cité de Québec, les 18, 19 et 20 janvier 1911, sous les auspices de l'Association Forestière Canadienne, et j'invite spécialement à cette convention:

Les Lieutenants-Gouverneurs des Provinces,
 Les membres du Sénat,
 Les membres de la Chambre des Communes,
 Les membres des Conseils législatifs et des Assemblées législatives des Provinces,
 Les officiers forestiers fédéraux et provinciaux,
 Le bureau et les membres de la Commission de Conservation,
 Les membres de l'Association Forestière Canadienne,
 Les membres de la Société Canadienne des Ingénieurs Forestiers,
 Les membres des Associations de Marchands de Bois,
 Les membres de l'Association de Banquiers Canadiens,
 Les membres de l'Association de Manufacturiers Canadiens,
 Les délégués des Boards of Trade et des Chambres de Commerce,
 Les délégués des compagnies de chemins de fer,
 Les délégués des Universités,
 Les délégués des Collèges d'Agriculture,
 Les délégués des Associations de Cultivateurs,
 Les délégués de l'Association de la Presse Canadienne,
 Les délégués des Clubs Canadiens,
 Les délégués de la Société Canadienne des Ingénieurs Civils,

Representatives of the Canadian Mining Institute,
 Representatives of Associations of Land Surveyors,
 Representatives of Fish and Game Associations,
 Representatives of the Bureau of Forestry of the United States,
 Representatives of the American Forestry Association,
 Representatives of the American Conservation Association,
 Representatives of State Forestry Bureaus and Associations and all others who are interested in Forestry.

(Sgd.) WILFRID LAURIER.

Les délégués des Sociétés d'Horticulture,
 Les délégués de l'Institut Minier du Canada,
 Les délégués des Associations d'Arpenteurs,
 Les délégués des Associations de Protection du Poisson et du Gibier,
 Les délégués du Bureau Forestier des Etats-Unis,
 Les délégués de l'Association Forestière Américaine,
 Les délégués de l'Association Américaine de Conservation,
 Les délégués des Bureaux Forestiers des divers Etats, des Associations et de tout autre corps intéressé à la conservation des forêts.

(Signé) WILFRID LAURIER.

Forestry for Municipalities.

By H. R. MacMillan, Asst. Inspector of Forest Reserves.*

The owning and management of forest lands, while a common and profitable department of municipal endeavor in Europe, is as yet comparatively unknown in America.

Up to this time the energies of forestry in America have been directed towards securing a wise and businesslike management of the great public forest areas; there has been little attention paid to the profitable development of the non-agricultural tracts which are found in the midst of, or bordering on, even the oldest, most intensively cultivated and most prosperous settlements.

Two new influences are now operating which tend to show that the municipal ownership and management of forest tracts is advisable. One is the growing knowledge of forestry, the basic principle of which is that all land should be devoted to its most profitable use; the other, and perhaps the most potent in America as yet, is that many towns and cities must own the watersheds from which they derive their domestic water supply if they wish to insure the purity of the water. The logical combination of these two factors has proved, as may be conclusively shown from extensive European and slight

American experience, that the crop of timber upon the land pays a sure profit and at the same time exerts a wholesome influence by increasing the supply and maintaining the purity of the water.

Municipal Forestry in Germany.

Municipal forestry can best be illustrated by German examples. In Germany the practice originated and in Germany it has become most general. Villages, towns, cities, states, corporations and churches all own and manage forests as a source of revenue.

Forests have there proved so profitable under municipal control that all land that is not valuable for agriculture or other uses has been purchased by private and public bodies and planted to trees. Land which has until now been used for agriculture and which is worn out or returns only a very small profit is being bought for forest planting. Land which because of its character or situation exercises a great influence on the surrounding country is bought and forested by the state. Such are the shifting sand dunes, head-waters of navigable streams, valleys and watersheds of mountain torrents and steep slopes of mountains where avalanches and floods are frequent and dangerous.

*Reprinted from *Canadian Century*.

But though municipal forestry is sometimes undertaken for protection it is most often undertaken for profit. The examples given below, taken from state reports, indicate the enviable position in which the management of forests and woodlots has placed some German municipalities.

Communities in Germany must count themselves as incomplete and unmindful of their opportunities if they do not own forests, for of the

only when it has passed its most profitable period of growth, and that every cutting is immediately followed by natural or artificial regeneration of young trees of valuable species. Under the state officers are locally-employed guards who follow the plans drawn up by the superior officers, transact the business, do the manual labor and protect the forest from fire or other destructive agencies.

In the intensively managed Ger-



[Courtesy N. Y. State F. F. and G. Com'n.]

German Forest 65 years old, as productive as the best Canadian Forest.

1,564 communities in the State of Baden, 1,530 have their own forests. There forests are managed as are farms in the countries where the agricultural colleges have reduced, or elevated, farming to a science. They are under the supervision of the state or imperial forest service, an organization of highly trained men whose duty it is to see that the land is devoted to the most profitable species of trees, that the mode of management is adapted to the various species, that the timber is cut

man forests the expenses of administration are very high; much labor is employed, excellent roads are maintained and an attention given to detail which could not be possible in America. Yet, because of the high prices of timber, and because the well-cared-for forests produce a much larger proportion of valuable timber per acre than our natural forests, the municipal forests are without exception highly profitable.

The city of Baden, with a popu-

lation of about 16,000, owns a forest of 10,576 acres. The total income from this forest averages \$100,000 per year. All these communal forests are so managed as to yield a permanent income, fluctuating very little from year to year. The total yearly outlay on the Baden forest is about \$33,000, nearly all of which is for labor. There remains each year a profit of about \$66,000 for the city treasury, an average annual return

land bears productive forests and the income is in consequence comparatively low. Moreover, the Heidelberg forest is managed as much from the aesthetic as from the business standpoint. Utility and productivity are in many instances sacrificed to beauty; the forest is made to serve as a park. Yet, though it is a young, unproductive forest, though it is kept in a condition which would put to shame many of our parks,



[Courtesy N. Y. State F. F. and G. Com'n.
Swiss Municipal Forest used also as a Park.

of over six dollars from each acre of forest.

The forest of Baden has been so long under scientific management that it has been raised to a high state of productivity and is very profitable. A newer forest is that belonging to Heidelberg, a city of 44,000 inhabitants, which owns a forest of 6,860 acres. The Heidelberg forest is yet in the process of formation, the city is still buying land and spending comparatively large sums in planting, which makes the expenses comparatively large, while on the other hand very little of the

the Heidelberg forest returns to the city which owns it a regularly increasing annual profit which is now about \$13,000 per year, or about \$1.90 per acre per annum above all expenses of maintenance and administration.

Village Forests.

Nearly all the villages in the State of Baden own and manage forests. Oberforster Jaeger of Donaueschingen, Germany, writes concerning the forests under his control: "The village of Braunlenger has 1,601 inhabitants and owns 4,507 acres of forest.

The amount yearly cut is 2,500,000 board feet of wood, comprising both lumber and firewood; of this all the firewood is given to the citizens as "Citizens' Gifts" up to 3,500 board feet each (about seven cords each); and a total of about 100,000 board feet of firewood (about 200 cords) is given to schools, town halls, churches and other public buildings. The lumber, amounting to about 1,500,000 board feet annually, is sold and brings to the community an average annual net income of \$21,600, so that the community is not only free from all communal taxes, but is also able to establish modern works, electric light plants, a water system, schoolhouses, churches and other buildings. Even the smallest villages profit by this common-sense use of the forest.

"The village of Aufen consists of 220 inhabitants and owns 163 acres of forest. The forester gives to each citizen about 200 board feet (about four cords) of firewood annually and sells annually 85,000 board feet of timber, which clears for the community more than \$1,440, with which the total expenses of the small village are met. The annual yield of this communal forest is 137,500 board feet."

The examples quoted are not exceptional. They are representative of the experience of thousands of the villages in Europe. The higher price of timber in Europe, the steady market for all the products of the forest, the leaves, the small trees from thinnings, the branches and the stumps, as well as the log contents of the trees, make the receipts higher than they would be in Canada. In addition, another source of profit lies in the great cheapness of labor. Men are hired for sixty cents a day; much of the work is done by women and boys who receive about forty and twenty-five cents each, respectively, per twelve-hour day.

Canada's Opportunities.

Though municipal forestry can not be as profitable in Canada as it is

in Germany and other European countries, it will, while furnishing labor, converting waste land into productive woods and improving watersheds, pay good interest on the money invested. Near many Canadian villages, towns and cities there are areas of waste sandy or rocky land, which, after having been farmed, have been abandoned as worn out, or which have been cleared of timber but never used for agriculture. Such areas are usually wastes of ugliness which detract from the value of the neighboring property. Their unproductivity increases the proportionate burden of taxes on the community and renders such public works as roads and bridges unduly expensive or proportionately poor in quality. If the waste land is sand it is in many localities blown about by the wind so as to destroy or decrease the value of adjoining farms. There are instances of this along the shores of Lakes Ontario, Erie and Huron. In every way waste land is not only a loss to, but a drag upon, the progressiveness of a community. Such land will always grow trees, and if the proper species be chosen, will produce valuable timber.

Waste land not far from centres of population can be bought for five dollars an acre or less. In some districts it can be bought for two dollars an acre. If this land happens to be, as it frequently is, covered with young trees of valuable species, the cost of planting is considerably reduced. In Canada waste land can be planted to young trees, e.g., white pine, for about eight dollars per acre. The cost of the land, the cost of planting, the cost of management, protection and taxes, with compound interest at three and one-half per cent., brings the cost of the plantation to about \$160 per acre at the age of sixty years.

There are no sixty-year-old plantations of white pine in Canada, but studies which have been made by foresters in white pine forests on similar land in Eastern America justify the prediction that an acre of planted

forest at that age will produce 80,000 feet of merchantable timber. Timber will be worth more in sixty years than it is now, and as Ontario lumbermen are paying the government ten dollars and over for the privilege of cutting forest-grown pine in rather inaccessible regions, it is safe to say that plantations of pine in settled districts will sixty years from now be worth at least ten dollars per thousand feet on the stump. This would make the plantation worth

year bought 168 acres of land constituting the municipal watershed, and has adopted a plan for planting it to profitable trees. The county of York, in Ontario, is considering a plan of purchasing and planting up areas of waste sandy land. The Ontario Government has bought several thousand acres of worn-out farms in different districts in Southern Ontario with the intention of converting them into profitable forests.



[Courtesy N. Y. State F. F. and G. Com'n.]

A recent Cutting, showing also the nearly mature forest which will next be cut and the young tree growth.

\$800 standing, without the profit on the small trees, thinnings and cordwood. This crop at \$800 represents a rental of \$3.25 per acre for every year of the life of the plantation, in addition to three and a half per cent. on all money invested.

This well-tried and business-like method of securing a financial return from waste land is one which should appeal to many Canadian municipalities. There are evidences that the idea is being adopted. The city of Guelph, the leader in municipal ownership in Canada, has this

How Forests Improve Water-Supply.

It is becoming evident that it is more advisable for a community to secure its water supply from a small stream or lake over which it may exercise control, than to take it from a larger body of water which is public to many communities, cared for by none, and is the repository of the sewage of all. Acting upon this principle, many American and a few Canadian cities have acquired the land surrounding the sources of the small lakes and streams furnishing their water supply. Not only have

communities done this, but in some instances where the water is supplied by a company or private individual this policy has been followed. Such land is usually rough, rocky, of little value for any other productive purpose and consequently cheap.

The original idea in buying the land was to withdraw it from settlement in order that there might be no danger of pollution of the water. Further investigation proved that when such land was covered with forest it not only returned a profit as shown above, but exercised a beneficial influence on the water supply itself. Small watersheds, such as those from which many of our cities derive their water supply, depend upon the local precipitation of moisture. This moisture escapes in four ways from the ground upon which it falls: by evaporation, transpiration, surface run-off and seepage run-off. The water which evaporates, or which is carried off by transpiration through vegetable matter, is lost. It is upon the surface run-off and seepage run-off, which are, under ordinary conditions in Eastern Canada, about one-half the total, that the reservoir must depend.

Evaporation is less in the forest than in the open. The rate of evaporation depends upon the exposure to the sun and wind. A thick forest cover protects the forest from the wind and sun, cools the air and by thus standing between the moisture-soaked ground and the absorbent air gives rainfall more time to soak away into the earth to feed streams and springs.

Growing vegetation uses each summer a great deal of water, which is gathered from the soil by the roots and given off through the leaves and green foliage. The amount of this water used each year varies from about fifty to five hundred pounds for every pound of leaf matter. The amount used by forest trees, espe-

cially conifers, is less than one-half the amount used by forage crops and grass, so that for this reason alone a watershed covered with trees should return more water to a reservoir than if it were under any other cover.

It is important that the water which reaches the reservoir by surface drainage and seepage should be pure and clean. If the watershed is denuded the soil bakes in the sun, becomes hard, and during and after rain sheds the water with such rapidity that the loose particles of soil are carried away with the flood, and the reservoir is filled with turbid water. Owing to the rapidity of the run-off the underground seepage is under such conditions very little. On the other hand, if the watershed is forested the surface of the ground is covered with a deep sponge-like mulch of vegetable matter, which absorbs the water and prevents a rapid run-off, except under cloudburst conditions. At the same time the surface of the soil is so bound together by interlacing roots that it is not easily washed away. The consequence of this is that surface run-off is slow and carries very few impurities, and the underground seepage is much greater comparatively than from any other type of soil cover. The water from this seepage is later given out clean and pure in the form of springs, the most desirable source of domestic water supply.

There is no doubt that when more intensive conditions prevail in Canada, when it becomes more necessary to devote every acre to its most productive purpose, and when the many benefits of communal forestry are more generally understood there will be many towns and cities that will seize this opportunity of devoting to a useful, beautiful and profitable crop areas which now shame our economies and blunt our sensibilities by lying idle and ugly.



[Photo G. C. Piché.

Students of Laval University Forest School at work at the Provincial Government's Nursery, Berthierville, P.Q.

M. Charles Guyot.

Directeur de l'Ecole Nationale des Eaux et Forêts.

Un changement important vient de se produire dans le haut personnel de l'Ecole nationale des Eaux et Forêts de Nancy, où M. François Dubreuil, Conservateur à Pau, remplace à la Direction M. Charles Guyot, admis, sur sa demande, à faire valoir ses droits à la retraite.

C'est une des personnalités les plus marquantes et les plus respectées du corps forestier français pour qui l'heure du repos vient ainsi de sonner, au terme d'une carrière des mieux remplies, toute d'honneur, de conscience et de travail.

Né à Mirecourt (Vosges) le 5 novembre 1845, M. Guyot, entré à l'Ecole forestière en 1866, en sortit le second et débuta dans l'Administration comme garde général à Dompaire, dans son pays d'origine. Dès ce moment, il s'adonna aux sciences juridiques, qui ont pour lui un attrait particulier, et commence des études de droit très complètes qu'il poursuit jusqu'à leur couronnement,

c'est-à-dire jusqu'au doctorat.

Ses aptitudes spéciales ne tardent pas à le faire distinguer, et en 1873, il est nommé Professeur adjoint à l'Ecole forestière, qu'il ne devait plus quitter par la suite. Il y occupa successivement les postes de Professeur répétiteur et Inspecteur des études (1880), Professeur titulaire (1889), Sous-Directeur (1893) et enfin Directeur (1898).

Dans la chaire de droit, M. Guyot fut un maître très écouté, clair et méthodique dans les exposés et les analyses, commentateur d'une érudition très vaste, toujours au courant des plus récentes décisions de la jurisprudence. Successeur de Meaume et de Puton, il soutient sans faillir la comparaison avec celle de ses illustres devanciers. Comme puissance de travail il leur paraît même supérieur, n'ayant jamais eu d'auxiliaire. C'est sur lui seul que pendant vingt ans reposa toute la charge d'un enseignement dont l'im-

portance, toujours grande, est allée croissant avec celle des attributions confiées aux Agents des Eaux et Forêts, aujourd'hui si variées.

Mais, ce n'était pas assez de préparer et de professer une centaine de leçons, de répondre aussi à maintes demandes de consultations, M. Guyot sut encore trouver le temps de composer de nombreux ouvrages, la plupart concernant naturellement les sciences juridiques, mais un certain nombre aussi traitant d'histoire ou d'archéologie, dont l'étude constituait pour lui un délassement de ses occupations habituelles. Parmi tant de publications d'un style toujours vigoureusement correct et châtié, il convient de citer surtout: Des droits d'emphytéose et de superficie, 1876—Contrainte par corps en matière criminelle et forestière, 1880—Répertoire général alphabétique du droit français; articles:— Défrichements, 1891; — Débits Forestiers, 1897; — Dunes, 1899; — Forêts, 1901.—L'enseignement forestier en France: l'Ecole de Nancy, 1898.— Commentaire de la loi forestière algérienne, 1904 — Cours de droit forestier, 1909.

Comment, à ses occupations professionnelles, M. Guyot trouva-t-il moyen de superposer encore des fonctions administratives, sans que celles-ci fissent tort à celles-là? C'est son secret, tout ce qui est certain, c'est que soit comme Inspecteur des Etudes, soit surtout comme Directeur, il eut à remplir une tâche fort lourde, qui lui prit souvent le meilleur de son temps. Il sut s'en acquitter, non seulement avec conscience, mais de façon tout particulièrement remarquable.

M. Guyot fut le septième Directeur de l'Ecole de Nancy, et l'un de ceux certainement qui ont le plus fait pour sa prospérité; son nom est à placer à côté de ceux de Lorenty, Parade et Nanquette. Son administration a été marquée, en effet, par un grand nombre d'améliorations, dont certaines fort importantes: rattachement à la station de recherches et expériences de la série de futaie

résineuse des Elieux; création d'un Arboretum à Champenoux, d'un établissement de pisciculture à Bellefontaine; remise à neuf des casernements, amphithéâtres, études, maintenant installés avec tout le confort moderne, institution d'un cours consacré à la sylviculture coloniale, classement général de la bibliothèque, etc., etc. Il est à remarquer aussi que les publications des Professeurs et Agents de l'Ecole paraissent n'avoir jamais été aussi importantes que durant les dix dernières années, et on peut avec presque certitude voir là se manifester l'influence de l'homme éminent qui se trouvait à leur tête.

En effet, il donnait l'exemple d'abord, exemple contagieux d'amour du métier, d'accomplissement consciencieux du devoir, de labeur et de dévouement. Puis, nul ne savait comme lui exciter, encourager et diriger les initiatives, éviter à ses collaborateurs des soucis et des difficultés dont il assumait seul la charge. Son humeur était toujours égale, son accueil toujours affable, et il savait témoigner à tous un intérêt, une sympathie cordiale, par où son action s'exerçait bien plus efficace et féconde qu'en faisant appel à l'autorité.

Quels sentiments éprouvaient pour un tel chef ceux qui avaient l'honneur d'être placés sous sa direction, on en a la preuve lorsqu'à la fin de l'année dernière, le personnel de l'Ecole nationale des Eaux et Forêts eut pour la dernière fois l'occasion de lui présenter ses vœux de bonne année; une réduction en bronze de la statue de René II, ornant la place St. Epvre à Nancy, lui fut alors offerte, comme témoignage d'attachement et de reconnaissance, et M. Thiéry, doyen du corps enseignant, se fit avec émotion l'interprète des regrets unanimes et très sincères éprouvés par les collaborateurs de M. Guyot, en le voyant quitter la chaire qu'il occupait avec une si grande autorité, et la direction où, depuis douze années, il s'était prodigué avec tant de dévouement.

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Ontario's Forest Fires.

Great Conflagrations that have Cost the Province Many Millions.

(Part of a paper read before the Association of Ontario Land Surveyors by J. F. Whitson, O.L.S., at their Sixteenth Annual Meeting.)

The most valuable of our hardwood timber was burned by the early settlers when clearing off their land, or was used as fuel, and to-day there are no hardwood forests to compare in area or quality with the original forests of the Indian peninsula (Bruce County), the Huron tract or the older part of Ontario bordering on Lakes Erie and Ontario, as hardwood is found only in small sections north and west of Lake Huron; nor can we compare our present pine forests with those that have been cut or burned over in the last fifty years.

Trent and Ottawa Valleys.

It is to be regretted that careless operations in the past by lumbermen have done much to lessen the supply of timber in this province. On carefully examining the reports of surveys and explorations made prior to 1855, I find that nearly all of the Huron and Ottawa territory, including the districts of Muskoka, Haliburton and Parry Sound and the counties of Addington, Hastings and Renfrew were practically a virgin forest of mixed timber, pine predominating, with only parts of a few townships burned over.

Prior to 1860 a virgin forest covered the territory on the upper branches of the Trent waters. In that year, however, a fire broke out on the Burned river, in the townships of Snowdon and Glamorgan, in Haliburton, caused by a trapper's smudge.

In 1851 the first fire of any magnitude to visit the Ottawa valley commenced at the mouth of the

Bonnechere river and burned over what was locally known as the Big Pine country. This fire originated from the burning paper of a musket fired by a river-driver. In 1868 the Bissett's Creek country, from the Ottawa river to Lake Traverse, on the Petawawa, was devastated, and in 1870 the Skead limits on the Opeongo. In 1876 the country from the Petawawa to the Bonnechere met the same fate, the fire having arisen through the carelessness of a river-driver.

In these fires alone the province lost several billion feet of its finest white and red pine. To-day you will scarcely find a township in the white and red pine country that has not been burned over in whole or in part, and in many instances the fires have swept over them several times.

North Shore of Lake Huron.

A. P. Salter, who between 1855 and 1857 outlined the north shore of Lake Huron from Lake Nipissing to Sault Ste. Marie and explored the country to a distance of about forty miles inland, describes the country as a vast forest of green timber. Scarcely a burned area was met with. The country was not as heavily timbered with pine as the Ottawa valley; there were, however, large areas of excellent pine and other mixed timbers. Since that date a series of fires has reduced the pine area north of Lake Huron by almost one-half.

The fires began in 1864. The fire of 1864 was the first destructive fire to devastate the north shore. It began near Ottertail lake, on the

Thessalon river, and worked its way west into the old cutting around Bruce Mines, and east to Blind river, where it reached some old saw-log cutting made by a French-Canadian named Salvoil. Continuing east along the shore it reached the mouth of the Serpent, where it destroyed a local mill owned by Lauzon. Here it met fresh fuel in the old cuttings and continued east to the Spanish and up that stream for many miles, almost the entire southern slope of the Killarney mountain being swept over from White Fish west to Collin's Inlet.

While this fire was burning, a fiercer fire was, in August of the same year, working its way west from the west arm of Lake Nipissing, and the two finally met somewhere in the valley of the Wanapitei.

This was, however, but a small fire compared with the one which followed it in 1871. The fire of 1864 followed the dry, moss-covered rocks and small pine ridges, but when it struck a deep swamp or muskeg it stopped or smoldered until it was revived by high winds or found fresh fuel in some of the old timber cuttings. During the following six years winds and storms levelled the dead timber and piled windfalls around the skirts of swamps and muskegs.

The summer of 1871 was exceedingly dry and hot, and hence very favorable for the fires, and at many points along the north shore from French river to Kaministikwia, on Lake Superior, fires started, swept over the dead timber and brûlé of 1864, destroying swamp barriers that saved the pineries six years before. Clouds of smoke, tipped with a fringe of flame, swept from one hill-top to another. Lakes, rivers and streams formed no barrier or protection. Township after township to the south of the French was swept over and millions of pine destroyed. The fire swept up the French, along the west shore of Lake Nipissing and up the Sturgeon; then,

swinging around westerly, it crossed the Wanapitei and continued to the head waters of the Spanish, up the Vermilion and west to the headwaters of the Mississagi and down that stream for over fifty miles. This fire swept with fierce energy over an area of over 2,000 square miles, leaving blackened and giant pines to be a reminder for over half a century of the immense destruction there and then caused, when a virgin forest was converted into a barren and desolate wilderness.

During the same summer many smaller fires broke out in different parts along the north shore of Lake Superior, around Port Arthur and points east. Exploration surveys were then being made for the Canadian Pacific Railway, and many fires were started through carelessness on the part of the men employed. An axeman on Mr. David Beatty's exploration party started a fire by burning out a wasp's nest on the line east of Red Rock, on the Nipigon river, which Mr. Beatty was unable to quench. He and his party were forced to flee for their lives and take refuge in a stream, but unfortunately six of his packers were overtaken and perished in the flames.

Probably a more extensive fire than that of 1871 was the fire of (probably) 1855, which was started by an Indian on Lady Evelyn lake, while burning over a blueberry patch. This fire burned easterly to the shores of Lake Timiskaming, up the Montreal river to its source, and westerly along the height of land for over two hundred miles to near Michipicoten, on Lake Superior.

Surveyors Salter, Gilmour and Sinclair, in their reports (1867) of the baseline from Michipicoten to the Montreal river, describe vast areas of burned-over territory, and from the trunks of trees then standing they were able to state that the country at one time contained a heavy growth of pine. I can do

nothing better than quote Salter's own words: 'Almost the whole of this district appears to have been devastated by fires at different times and at periods more or less remote, which swept away the original forest, some remains of which are still to be seen in the shape of huge trunks of pine, blackened and charred by the fire. The country to the north of my line, along the height of land, has been swept over by fire, and now is, for an area of 2,000 square miles, a desolate wilderness. Judging from remains still standing it was formerly covered with pine and other timber.'

Vast areas west of Lake Superior, along the southern boundary of the province as far as Rainy Lake, which at one time contained large quantities of pine, were destroyed prior to 1857, probably about the year 1845. These fires burned over thousands of square miles, both in Ontario and Minnesota. From the top of a high mountain on Hunters' Island no less than 1,000 square miles of just such country can be seen, extending as far as the eye can carry in almost every direction.

Coming down to more recent dates, I might mention the fires of 1877, which burned over extensive areas in Parry Sound; the fire of 1891, which swept along the Canadian Pacific Railway for nearly sixty miles from Pogamasing Station to near Woman river, and a more recent one which in 1896 burned over the same territory and the entire shores of Biscotasing and Ramsay Lakes, and from the headwaters of the Spanish and Mississagi rivers to near Flying Post, north of the height of land, a distance of over seventy miles. These two fires alone devastated over a million and a quarter acres. Being an eye-witness of this fire, I am able to form some idea of what a forest fire in a pinery in a dry season is, and how utterly impossible it is to check it.

I might also mention the fires of 1894, which swept over Northern Minnesota destroying over 140 lives; this fire crossed Rainy River into the Rainy River Valley, burning over several of the newly scattered townships, and destroying the lives of six members of a family named Gamsby.



[Photo R. B. Miller.]

Looking for Old Lines, part of the Field Work included in a Forest School Course.



[Photo R. B. Miller.]

Forestry Students of the University of New Brunswick Scaling and Tallying Logs.

A Uniform Log Rule for all Canada.

By A. H. D. Ross, M.A., M.F.

Up to the present time, no less than 54 different rules have been devised for the purpose of estimating the contents of logs of given diameters and lengths. Some 46 of these may be described as board measure rules, and the remaining 8 as volume rules. The board measure rules profess to give the number of "board feet" of inch lumber that may be sawn from logs of given dimensions, and the volume rules give a more or less accurate estimate of the cubic contents of the logs.

As milling operations extended into new regions, and as improvements were made in the machinery used, it was found necessary to devise new rules to suit the changed conditions; hence the great number of rules in use in the different lumbering regions. Of the 46 board measure rules, 17 may be described as formula rules, 17 as diagram rules, 8 as mill tallies, and 4 as combination rules.

What I have designated as formula rules include the International, Champlain, Universal, British Columbia, Preston, Baxter, Doyle, Ake, Square of Three-Quarters, Square of Two-Thirds, Cumberland River, Forty five, Ropp, Vermont, Winder, Stilwell and Orange River Rules. A comparison of the formulae upon which these 17 rules are based brings out some very interesting regula-

tions. To the diagram class belong the Scribner, Maine, Bangor, Parsons, Quebec, Spaulding, Favorite, Hanna, Drew, Baughmann Rotary Saw, Baughmann Band Saw, Derby, Part-ridge, Wilson, Finch and Apgar, Warner and the Younglove Rules.

The mill tally rules include the Carey, Chapin, Dusenberry, Saco River, Northwestern, Wilcox, Herring and Schenck. From the nature of the case, these rules have only a local value.

In the combination class we have such rules as the Doyle-Scribner, Doyle-Baxter, New Brunswick and Boynton. The first of these has been adopted by the National Hardwood Lumbermen's Association, because the hardwoods are generally very defective. It is a combination of the Doyle figures up to 28 inches and the Scribner figures above that diameter. The New Brunswick rule is a combination of the Vermont figures from 11 to 18 inches and the Maine figures from 19 to 24 inches, but is too limited in its range to be of much practical value.

The volume rules include four 'standard' rules: the Ohio River Cube, the Constantine, the Ballou and the New Hampshire.

The Nineteen-inch Standard, or 'Market,' is equivalent to the volume of a log whose middle diameter is 19 inches and whose length is 13 feet. As the volumes of logs of other dimensions vary as the squares of

their diameters and directly as their lengths, it therefore follows that if D is the diameter of the log in inches and L is its length in feet, it will contain $D/19 \times D/19 \times L/13$ Standards, or 'Markets.' In the case of the Twenty-one Inch Standard, the standard diameter and length are 21 inches and 13 feet; in the Twenty-two Inch, 22 inches and 12 feet; and in the Twenty-four, 24 inches and 12 feet.

With such a welter of rules — many of which are grossly inaccurate and no two of which agree — is it any wonder that there is a widespread desire for the adoption of a universal standard of measurement?

Factors to be Considered.

In the framing of a board measure rule, the following factors should be taken into account: (1) An accurate knowledge of the volume of wood inside the bark; (2) The percentage of the wood that will be converted into sawdust by the sawing of the log into inch boards; (3) The amount of waste in slabs and edgings; (4) The minimum width, or minimum board measure, of the boards to be included; (5) The effect of the taper of the logs upon the amount of lumber that can be sawn out; (6) The effect of normal crook in diminishing the amount of lumber that can be obtained from perfectly straight logs. In all cases it is assumed that the machinery used is in good condition and of modern type, that the sawyers are reasonably skillful and that the logs are sound. Discounts for such defects as 'butt-rot,' 'ring-shake,' 'gum-seams,' etc., must necessarily depend upon the experience and judgment of the scaler.

The saw-kerf waste is always some fraction of the area of the end of the log, and consequently increases as the square of its diameter. Some of the first saws in use cut a kerf of almost half an inch and consequently wasted 33 per cent. of the wood in separating the log into inch boards. Simple arithmetical calculations show that the percentage waste for saws of given kerfs is as shown in the table given below.*

From these figures it will be seen what a saving may be effected by the use of thin saws.

The deduction necessary for the square-edging of the boards is found to be almost proportional to the bark surface of the log, and therefore increases directly as its diameter. Curiously enough, the only rules which provide for the edging allowance in a rational way are the International, Champlain, Universal, British Columbia, Baxter and Preston. In the International it is computed from the circumference of the log at its middle point; in the Champlain and Universal from the circumference at the small end; and in the

British Columbia, Baxter and Preston at certain depths beneath the bark.

The most peculiar thing about the whole business, however, is that the International is the only rule which properly takes care of the allowances which should be made for the taper of the logs, and the normal crook found in nearly all classes of timber. It assumes that in 12-foot logs the taper averages $1\frac{1}{2}$ inches, and that the average major crook is also $1\frac{1}{2}$ inches. The saw-kerf allowance for this rule is one-eighth of an inch, with a safety factor of $1/16$ of an inch for uneven sawing and the shrinkage of the boards in drying. This makes the volume of the untrimmed boards $16/19$ of $.7854 D^2 \times L \div 12 = .6613 D^2 \times L \div 12$. When $L = 12$ feet, this formula becomes $.6613 D^2$; or for each four-foot section, $.22D^2$.

The amount of the surface waste was calculated geometrically, checked by means of diagrams, and tested at the mills. The result showed that it amounted to $2.12 D$ for 12-foot logs, or $.71D$ for each four-foot section.

The extra short boards had to be at least 3 inches in width or contain at least two board feet.

The formula for each four-foot length is $.22D^2 - .71D$, and the rule has been computed for logs varying from 8 to 20 feet in length, and for diameters varying from 3 to 60 inches. In order to effect a saving in the clerical work of computing tallies, the figures were then rounded off to the nearest multiple of 5, the error being compensating where a considerable number of logs is measured.

International Rule the Best Rule.

As this is the only log rule which takes into account the factors that influence the amount of lumber that can be produced from normally straight and sound logs, I have not the slightest hesitation in championing the cause of the International. I do not hold a brief for the author, or the rule, but judge it simply on its merits. A test of it was made in one of the mills in the Ottawa valley and showed that the rule is an exceedingly accurate one. The theoretical scale of 402 white and red pine logs of average quality, measured as they came to the saw carriage, was 82,920 board feet. The sawyer was reckoned by his employers to be a good man, but not the best in their employ, and the actual product in square-edged boards was 83,288 board feet—thus overrunning the scale by $4/10$ of one per cent. Some 245 of the logs were from 6 to 20 inches in diameter and 157 of them from 21 to 33 inches. For the sake of comparing this rule with the Champlain, Scribner and Doyle rules, the diameter between 6 and 17 inches are overlapped in the following table:—

* Saw kerf (inches)...	...	...	...	...	1-2	7-16	3-8	5-16	1-4	3-16	5-32	1-8	7-64	3-32
Percentage waste ...	...	...	...	...	33	30	27	24	20	16	13	11	10	8.6

Diameter of small ends of logs.	Number of logs tested.	Percentage over-run of saw-cut as compared with the scale by				Diameter of 16-foot logs	Doyle scale	Actual scale	Scrib. scale	Que. scale	Champ. scale	Inter. scale
		Inter.	Champ.	Scrib.	Doyle.							
6-8 in.	28	2.6	10.3	33	143	4 in	0	6	7	12	8	5
7-9 in.	54	2.3	8.8	35	115	5 in	1	12	13	15	14	15
8-12 in.	101	0.0	7.1	34	72	6 in	4	19	18	16	22	20
10-17 in.	104	-1.1	4.7	23	45	7 in	9	30	24	24	32	30
18-20 in.	90	0.5	6.7	14	24	8 in	16	40	32	32	43	45
21-24 in.	126	1.1	5.2	14	18	9 in	25	55	42	45	56	55
25-33 in.	31	-0.5	3.3	9	10	10 in	36	67	54	59	70	70
						12 in	64	101	79	80	105	105
						14 in	100	154	114	120	146	150

These figures show that the Scribner and Doyle rules are not at all suitable for small logs; and the logs are becoming smaller and smaller all the time in Canada, as most mill men know to their cost.

Another point in favor of the International rule is that, being based upon a correct mathematical formula, it can be modified to meet the case of saws with a different kerf from that upon which the rule was built up. In this connection, I recall an amusing instance of a friend of mine who made a most elaborate calculation to prove that the kerf of the saws has nothing to do with the amount of the surface waste. A little reflection would have shown him that the width of the edged boards depends entirely upon the distance between the saws and is quite independent of the width of the track they cut.

If the kerf of the saws which separate the log into inch boards is $\frac{1}{8}$ of an inch and the scale is 1,000 feet board measure; then, with saws cutting a kerf of $\frac{7}{64}$ inches it will be 1,013 feet; for $\frac{3}{16}$ inch, 950 feet; for $\frac{1}{4}$ inch, 905; for $\frac{5}{16}$ inch, 864; for $\frac{3}{8}$ inch, 826; and for $\frac{7}{16}$ inches, 792 feet.

Other Formula Rules.

The Champlain and Universal are the only other rules which can be modified to meet cases of this kind, but, unfortunately, neither of them takes into account either the taper or the crook of the logs.

The Doyle, Square of Three-Quarters, Square of Two-Thirds, Ake, Cumberland River and other formula rules are based upon formulae which are purely arbitrary. The Doyle rule, in particular, may be defined as a regular mathematical monstrosity. Its formula is $(D-4)^2 \times \frac{3}{4} \times L$. 12; which may be written in the form $(D-4)^2 \times L$ 16. In the case of 16-foot logs this becomes $(D-4)^2$. If we now take the case of a 4-inch log the scale would be 0, which is manifestly absurd. The following table compares the Doyle scale for 16-foot logs with the actual scale and the Scribner, Quebec, Champlain and International scales, and proves rather conclusively the unsuitability of the Doyle rule for the smaller sizes of timber:—

From these figures it may be argued that the Scribner rule should be adopted as a compromise between the Doyle and actual scales. As a matter of fact, it has been in use for some years now, in the work connected with the National Forests of the United States. This does not necessarily mean that it is a satisfactory scale, but rather that it has been adopted for the sake of uniformity in the work of estimating timber, making tables of growth, etc. Being a diagram rule (as is also the Quebec) its values cannot be readily corrected so as to make them conform to new or special conditions of manufacture.

The Cubic Foot Unit.

From what has been said, it will be seen that there are real difficulties in the way of adopting any particular board measure rule as the standard unit of measurement throughout the whole Dominion. What I would suggest is the adoption of the cubic foot unit. It has been used for many years now for the measurement of square and waney timber, and everybody understands it. For the sale of pulpwood, extract wood, fuel, etc., it is a most satisfactory unit of measurement, and the purchaser knows exactly how much he is paying for.

Even if all the parties interested could be got to agree upon any one of the log rules at present in use, much would depend upon the method of applying it, particularly in the case of long logs. In South America, in Japan, in the Phillipine Islands and throughout the greater portion of Europe, timber is generally sold by the cubic metre. As Canadians would find this unit of measurement rather confusing, and are already familiar with the cubic feet unit, I should say, by all means, let us adopt it. Logs with the greatest diameter would naturally command the greatest price, as is already the case with poles, posts and spars; and the manufacturers would soon find converting factors if they wished to saw them into boards. People in other countries find a cubic unit of measurement a most satisfactory one, and there is scarcely any doubt that the Canadian people would find the cubic foot the most satisfactory unit of measurement. Such unit would be fair to both buyer and seller and it would be a matter of supreme indifference to the seller whether the buyer saws them

into boards, plank or deal, converts them into railroad ties, dimension stuff, scantling, lath, pickets or shingles, grinds them up for pulp, slices them into veneer or burns them.

[At the annual meeting of the Canadian Forestry Association a committee was formed to consider the possibility of a uniform log rule for all Canada. Some lumbermen are already discussing the same subject, so that this article by Mr. A. H. D. Ross, M.A., M.F., lecturer in the Faculty of Forestry of the University of Toronto, from the Canada Lumberman, is quite apropos. Those who have given the matter attention are invited to send in their views for the guidance of the committee.—Ed. C.F.J.]

RESPONSIBILITY FOR FIRES.

Writing to the Secretary, Dr. A. T. Drummond, of Toronto, in referring to an editorial recently published in the Toronto Globe, 'Forest Fires—A National Menace,' says:—"It interested me especially as it seemed to suggest what, for many years, I have been trying to emphasize, viz., that the carelessness of the camper in creating forest fires should be regarded as criminal, and, further, that the railways should be forced, under a large penalty, to become responsible for the protection of the forests along their tracks."



[Photo R. B. Miller.]

A Cruising Party.

PLANTING RIVER BANKS.

Mr. David Robertson, barrister, of Walkerton, makes the following suggestion: 'On almost every cleared farm that is cut by, or borders on, a river, there is a vacant space between the cultivated fields and the river that might well be utilized for the purpose of forestry. The almost complete destruction of timber along the banks of rivers is certainly affecting the climate and making the spring floods greater and water in the summer time very much lower. It has struck me that legislation might well be passed either empowering municipal councils to grant a bonus to farmers who would plant trees along the banks of the river or authorizing the municipal councils to do so themselves.'

RAILWAY FOREST POLICY.

'One of the best methods by which railroads can insure themselves against a shortage of ties and timber in the future is for them to own and manage their forests. A number of roads have already adopted this policy. Some have withdrawn from the market the remainder of their forest land grant areas; others have purchased forest land outright. The management of the existing forests is more economical and in the long run will probably be more satisfactory than the establishment of plantations.'—President Wm. McNabb, of the American Railway Engineering and Maintenance of Way Association, in his annual address, Chicago, March, 1910.

Another Forest Fire Horror.

Two Minnesota Towns Burned and Forty Lives and Much Property Lost.

After the awful forest fires that occurred in Montana and Idaho in August last it would have seemed that the United States had had a sufficiency of forest fire horrors for one year; but there was still in store one of the worst calamities of 1910. In a part of the country that already had been badly afflicted, earlier in the season, by the fire scourge, there occurred, in early October, a disastrous fire that in one day exacted toll of some forty lives and several millions of dollars in property.

In Northern Minnesota the whole season, from April forward, had been an unusually dry one, and the county had become dry as tinder. Quite a little of the territory in the vicinity of the Lake of the Woods (traversed by the Canadian Northern Railway) had been cut over and much brush and refuse lay on the ground. The soil, too, was of a peaty nature. Conditions, consequently, could not have been much worse for the starting and spread of a fire, nor the chances of extinguishing it, when once started, much less. Some of the country had been already burned over and considerable debris remained on the ground. The country is sparsely settled, and there are scarcely any wagon roads, only mere trails.

The state appropriation for fire protection was exhausted on Sept. 1st and the service was then discontinued.

Many fires had already occurred during the season and part of the area had been already burned over in July. Hence the people had become so accustomed to the fires that their proximity gave rise to no alarm. In Beaudette, it is said, many packed up their furniture and other belongings on the day of the fire; but the fire, when it came, swept down on the place so suddenly that there was no chance to save anything.

The fire is reported to have started during the latter part of July on the Canadian side, and to have slowly worked its way, as a ground fire, along, and in, the peaty soil southwards to the main branch of the Beaudette river and north to Rainy river, covering an area of about eight square miles.

Up till the beginning of October it merely smoldered, but finally began to assume serious proportions, and on Friday, October 7, a very high wind arose and fanned the fire to tremendous proportions. Another fire raged about the same time along the railway right-of-way, just east of White Road river, which worked east three miles and about two miles back on each side of the track.

Despatches of Oct. 5 reported the de-

struction of Graceton, Minn., a small place on the C.N.R., some thirteen miles west of Rainy River, Ont.

The hurricane of October 7 raised the fires to fearful proportions. At 2 o'clock in the afternoon Pitt, a small town on the line of the railway, a few miles west of the international boundary, was reached and consumed. The fire, working eastward, reached the towns of Beaudette and Spooner about half past eight in the evening, and a couple of hours later little remained of the places but blackened ruins. The fire also crossed the river to Rainy River, and the Rät Portage Lumber Co.'s mill, which was with great difficulty saved from the fire of July 21 and 22, was burnt, with several dwelling houses and small buildings.

Prompt action on the part of the C. N. Railway saved the lives of the people in Beaudette and Spooner, the railway having made up a train of box cars, which carried the people across the river to the town of Rainy River, Ont.

The entire zone covered by the fire was estimated to have a length of 85 miles and a width of 30 miles.

The burned district was immediately placed under martial law and little or no lawlessness is reported.

The county swept by the fire is generally level, covered principally with Norway and jack pine, spruce, balsam, white birch and tamarack.

The greatest loss occurred in the counties of Rousseau and Beltrami. The property loss in Beaudette, Spooner and Rainy River is reported to be \$1,500,000. The Shevlin-Mathieu Co.'s mill at Spooner was saved, but 30 million feet of lumber in their yards was destroyed. The C.N.R. had 250 tons of coal burnt at Beaudette.

In the towns of Beaudette and Spooner but one life was lost, that of a servant of Mayor Berg of Spooner. This is the more remarkable as there were many sick people in the town at the time who had to be hurriedly moved.

The loss of life occurred in the country districts, where people in their efforts to escape were overtaken by the flames. In several cases, whole families were blotted out in this way. Several made their way for safety to the railway, but in vain, the fire sweeping down on them, killing them. Many saved their lives by getting into streams or into cellars or caves.

Relief for the sufferers was at once forthcoming, the cities most active in this being

St. Paul, Minneapolis, Duluth, Crookston and Virginia (Minn.), Fort Frances (Ont.) and Winnipeg (Man.). The chief private contributors from the last named place were the T. Eaton Co. and J. L. Hyland. Chisholm, Minn., the little town that was burned in the forest fires of 1908, sent a contribution of \$200.

Twelve families in all were burned out on the Canadian side, in Rainy River and the township of Atwood.

The distribution of relief in Spooner and Beaudette was in the hands of the National Red Cross Society of the United States.

Up to October 12, 28 bodies had been recovered.

Much credit for life saving is due the C. N.R. who freely put special trains at the disposal of refugees.

On the evening of Oct. 12 a heavy rain came up which continued some time and the fire was thus quenched.

The town of Warroad, Minn., was also threatened by the flames which were, however, fought off.

Steps for rebuilding were at once taken in Spooner and Beaudette.

Dominion Forestry Work.

Resumé of the Report of the Superintendent for 1909.

The report of the Superintendent of Forestry for 1909, lately issued, gives many interesting particulars of the work of the Forestry Branch of the Department of the Interior, and notes considerable progress in the work over previous years.

Forest Fire Protection.

During the year 1909 the number of fire rangers employed was 96, as against 47 during the previous year. Nearly half of these (45 in all) were employed in patrolling the Rocky Mountain country from the international boundary up to the Peace, Athabaska and Lesser Slave regions. The Railway Belt in British Columbia was guarded by 37 rangers, while in Saskatchewan 14 were employed. As in most previous years the largest number of fires—those, at least, whose causes were known—arose from the building and operation of railways. Next to these, settlers clearing land and burning brush were most culpable, while campers and travellers were also to blame for a very large proportion of the fires.

Constant patrolling of all places where danger exists is the chief means taken for the prevention of fires. As opportunity offers, this is supplemented, especially on the forest reserves, the comparatively limited areas of which give better opportunities for careful fire protection. On Shuswap Lake, B.C., for instance, a gasoline launch is used, which serves not only to enable the ranger to cover his beat more quickly, but in case of serious fire would prove invaluable in getting men and supplies to the scene of the fire expeditiously.

On the forest reserves fire-guards are made

along the boundaries and along the lines of railway passing through the reserves. Some of these guards are made by burning the grass and other herbage at the season when the snow has disappeared from the surrounding cultivated districts and before it has gone from the forest, so that there is no danger to the latter. Ploughed guards are also made. Roads are being constructed in the reserves, which not only make it possible to get men to a fire more quickly in order to fight it, but also serve to stop small fires and in case of larger fires give a base from which to 'backfire.'

Special attention has also been given to the problem presented by fires arising from the construction and operation of railways. The patrol along the route of the G.T.P. during its construction west of Edmonton has been very successful. During the two years of construction work not one serious fire has occurred along the right-of-way.

The prevention of fires along the railway due to sparks from engines is another very serious matter. In some places in the forest reserves the railways have been compelled to make fire-guards along their right-of-way. Efforts are also being made to get the railways to clear up the brush from their lines. One western railway this spring had a fire arising from their neglect to follow the instructions of the branch in this regard and lost several miles of valuable timber through the fire which started from brush along their track having been ignited by fire from an engine.

During the year reported on, a complaint was laid against the Great Northern Railway before the Railway Commission for starting fires along its lines in British Columbia.

The Railway Commission has also been requested to give authority to officers of the fire ranging staff to examine locomotives at divisional points in order to see that they have the equipment required by law in the shape of spark-arresters, etc.

Forest Reserve Extension.

The most striking development in regard to the forest reserves is, of course, the setting aside of the Rocky Mountain forest reserve, a tract of country aggregating some 14,400 square miles, some of which is already reserved as National Parks (i.e., the Rocky Mountains Park, the Kootenay Lakes Park and Jasper Forest Park). The great importance of this reserve is due to the opportunity it affords for the preservation and conservation of the waters of the rivers which rise in the Rockies and traverse the prairie country and whose waters play so important a role in the fertility of the soil of this, one of the richest farming countries of the world. The forest on the tract consists mainly of lodgepole (or black) pine, Engelmann spruce and Douglas fir. Very serious fires have occurred throughout the reserve in time past but the natural reproduction, over the greater part of the reserve at any rate, is abundant.

Further extensions of the reserves are contemplated, in fact, some of the lands have already been reserved from settlement, though not formally set aside as reserves. Among the proposed extensions are:—

To the Sprucewoods reserve, 70,000 acres.
To the Duck Mountain reserve, 136,000 acres.

To the Cypress Hills reserve, 80,000 acres.
To the Beaver Hills reserve, 20,000 acres.

Similar action has been taken in regard to a tract of 5,000 acres near Spirit Lake, Sask. The foregoing extensions total 305,000 acres, or over 475 square miles.

A tract of land which includes Mount Ida and the Fly Hill's (near Salmon Arm, B. C.) was also inspected in the fall of 1909, with a view to its being set aside as a forest reserve.

Tree Distribution.

The work of free tree distribution to homesteaders, on the prairies inaugurated in 1901 is still on the increase.

For some years past the number of trees distributed each spring has been in the neighbourhood of two and a half millions. The nursery station at Indian Head, Sask., has reached almost its capacity, and if the distribution is to be enlarged the nursery capacity must be correspondingly increased.

In the spring of 1909, 2,570,000 trees were sent to 2,010 applicants. In the spring of 1910 about the same number of trees was sent to 3,173 applicants.

The increase in the number of applicants is also strikingly shown by the fact that in

1908 the average number sent to each applicant was 1,400 while in 1910 the number had had to be reduced to 800. The number of trees distributed remained practically the same. The number who received trees, however, increased from 1,424 in 1908 to 3,173 in 1910. In 1909, too, the number of new applications for trees was 2,235, in 1910 this number had increased to 3,832.

Farmers are urged to grow their own maple and ash trees from seed. Caution must, however, be exercised as to where this seed comes from, and, if possible, native seed procured. In the summer of 1908 many Manitoba maples were found to have been killed back, either wholly or partially, during the preceding winter. These had been raised from seed obtained from Dakota, and to this fact their inability to resist the weather seems due. The Forestry Branch has previously had similar experiences with seed obtained from Minnesota and from Eastern Canada. Failure of the local supply of seed, however, occasionally makes it necessary to resort to imported seed.

Irrigation.

Administrative work in irrigation occupies an important place in the work of the Forestry Branch, and consequently in its report. The need of careful regulation of the water supply in the prairie region is noted, in view of the many towns and cities requiring water for domestic supply. Moosejaw, for instance, and many smaller towns along the 'Soo' line must use the waters of Moosejaw creek; hence a study of the basin of the creek and the possible supply of water to be got from it is under way. This must be followed by a similar study, which will comprise a topographic and hydrographic survey, of all the basins in the irrigation district.

Notes are given of the progress of the larger irrigation schemes, such as the Southern Alberta Land Company and C. P. Railway undertakings; the activity in developing smaller irrigation schemes, especially in the country in the Wood Mountain district, in that south and east of the Cypress Hills, and in the region between the Red Deer and South Saskatchewan rivers lying north of Medicine Hat and the country north of the Red Deer. The hydrographic survey should be extended into this district also.

The progress of the hydrographic survey* is taken up and the progress of the work on the examination of the Milk and St. Mary's rivers noted. The extension of the work into the Wood Mountain district and the valley of the Frenchman river is also urged.

*Since this report was made there has been published by the Branch the 'Report of Progress of Stream Measurements for the Calendar Year 1909.'

National Parks.

A short descriptive note on the Jasper Forest Park is given. Agriculture has been practised successfully, it is noted, within the Park. The effect of fires has been bad, but the succeeding reproduction is good. A short paragraph is given relative to a visit to the hot springs at Fiddle Creek, in the Park.

At Banff Park the protection afforded to the game has resulted in a considerable increase in the number of the animals. It is hoped shortly to take steps in the direction of making Banff a winter resort as well as a summer resort.

Note is also made of further shipments of buffalo by M. Pablo to Buffalo Park.

Other Work of the Branch.

Reference is made to the beginning of the statistical work of the Branch. In this connection is noted the increasing use of inferior species of wood throughout the Dominion, of which figures are given.

The returns from the sale of timber for

1909 showed a good increase over those of previous years.

Appended to the report of the Superintendent of Forestry are the reports of various other officials of the Branch. Especially interesting to all who keep track of the progress of forestry in the Dominion is that of the Inspector of Forest Reserves. Among the topics taken up therein are the work in the protection of the forest reserves from fire (along the lines of his article in the CANADIAN FORESTRY JOURNAL of Dec., 1909, and giving the figures), and the general conditions on which mills should be admitted into the reserves. A tabular statement of all license and permit berths operated in forest reserves and statistics in regard to settlers' permits are given. The Inspector reports improved conditions as the result of permits being granted by forest rangers instead of by the Dominion Land agents. Hay permits, grazing and reforestation (including the establishment of nurseries, sowing and planting on the reserves) are also taken up.

WOMEN AND CONSERVATION.

All over the United States women are taking keen interest in forest conservation. They realize that aside from what conservation on the one hand or reckless waste on the other means to the race, the preservation and right use of the forest means much to them as home makers, in that forest destruction means the increased cost of the home itself, of the furniture, and of the fuel to heat it. The question of water supply, of healthful easily reached holiday places and a hundred other things are bound up in the maintenance of nature's balance.

The forest laws of Pennsylvania are among the best in the United States, and Dr. John T. Rothrock, the veteran advocate of forestry, says that these laws never would have been passed if the women of the State had not turned out and worked for them. Of those who have taken a leading part in this campaign, one is Miss Agnes Laut, the Canadian authoress, who by voice and pen has endeavoured to arrest the spoliation of the continent. One of her striking paragraphs when addressing women's clubs and similar organizations is that relating to the rapid advance in the price of seal coats. That the cause for the advance is both a real and a preventable one is brought out: Twenty-five years ago, states Miss Laut, there were, according to calculations, some five million seals on 'the rookeries'; about five years ago there were one million, and to-day there are less than twenty-five thousand. In less than twenty-five years, unless something is done to prevent the wanton and senseless slaughter, there will not be a seal alive.

BRITISH FORESTRY SCHOOLS.

Instruction in forestry is now given in ten institutions in Great Britain. The University of Oxford has taken up the work formerly carried on by the Royal Indian Engineering College at Cooper's Hill, and a School of Forestry has been established in the Forest of Dean by the Commissioners of Woods and Forests. Besides these, systematic courses of forestry are now offered by the following eight institutions: Cambridge University, Edinburgh University, the University College of North Wales, Armstrong College, the Royal Agricultural College at Cirencester, the Glasgow and West of Scotland Agricultural College, the Edinburgh and East of Scotland Agricultural College and the Aberdeen and North of Scotland Agricultural College.

DIFFERENT LUMBERING METHODS.

An interesting comment on the difference between eastern and western logging methods was given by items taken from almost contemporaneous issues of the *Fredericton (N.B.) Gleaner* and the *Vancouver (B.C.) Province*, some time ago. The former noted that the lumber cut of the province for 1909 would be about twenty-five per cent. less than usual, partly owing to the lack of snow; the western daily, under the heading 'Snow Interrupts Logging Operations,' said that recent heavy snowfalls had resulted in nearly all the logging camps on the coast being forced to suspend operations.

Fire Losses in Montana and Idaho.

An Official Estimate of the Amount of Timber Burned Last August.

A rough estimate of the fire loss upon the National Forests in Montana and Northern Idaho, made by forest officers of the U. S. Department of Agriculture, puts the total amount of timber killed or destroyed in this one district at over 6,000,000,000 board feet, while the area burned over is put at over $1\frac{1}{4}$ million acres.

The heaviest losses were in two Idaho forests, the Coeur d'Alene, where over 3,000,000,000 board feet of timber are reported killed or destroyed and over 450,000 acres burned over, and the Clearwater, where 1,000,000,000 feet of timber were killed or destroyed and 300,000 acres burned over. On the Helena National Forest, in Montana, the loss in timber is believed to have been 500,000,000 feet, on the Cabinet Forest 400,000,000, and on the Lolo Forest 300,000,000.

A large part of the losses on the Coeur d'Alene, Clearwater and Lolo were due to what became practically one great fire. The burn is shown on the Forest Service maps as extending in a northwesterly and southeasterly direction from north of Wallace, Idaho, to a point some 30 miles southwest of Missoula, Mont., or nearly 100 miles. At its widest point this burn has a width of about 40 miles, but its shape is very irregular.

It was really a union of a number of separate fires, driven to fury by the fierce hurricane of August 26. To the west of the Idaho-Montana boundary in the region of this fire lies a very inaccessible mountainous country, into which, on account of the absence of trails and of forage, it was almost impossible for forces of fire-fighters to penetrate. When the hurricane arose it drove the fires upon the parties which were hewing a way towards them,

forced these parties to seek refuge wherever it could be found, and swept down upon the forests where the fires were up to that time generally well in hand. The extensive losses are ascribed to the combination of hurricane and lack of means to get to the fires and put them out before the storm came. On the forests which were best equipped for controlling fires the results achieved are regarded as a demonstration of the efficacy of the fire-fighting methods employed, even under highly adverse natural conditions.

Forester Graves believes that, as usually happens in the case of big fires, there will be found to be considerable areas of living timber within the regions now mapped as entirely burned over. Of necessity the figures given are tentative, for it has been impossible to examine all the burned areas thoroughly. As fast as possible, however, the forest officers are locating and estimating the bodies of timber killed but capable of being lumbered, if taken in time.

How much of the 6,000,000,000 feet which was either killed or burned up in Montana and Northern Idaho can eventually be salvaged it is, of course, impossible to predict. If it were all a total loss, and if its stumpage value were put at the average price at which National Forest timber was sold last year, it would be the equivalent of a money loss of about fifteen million dollars.

It is believed that last summer's fires either burned up or killed between one and two per cent. of the total stand of National Forest timber. At the present rate of cutting from the National Forests, 6,000,000,000 feet is equal to 12 years' supply; but it is less than one-sixth of a single year's cut in the entire country, or enough to keep all lumber mills in the United States busy for something under two months.

THE FRENCH REPORT.

Various causes have combined to delay the issue of the report in French of the convention of the Canadian Forestry Association at Fredericton in February, 1910. The report is now being hurried, however, and will be ready for distribution soon after this issue of the Journal reaches its readers.

TREES FOR THE LAWN

Weeping birch, mulberry, ash, willow and elms. All kinds of shrubs, fruit and ornamental trees, hedge plants, roses, vines, evergreens, from 10c up.

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National Irrigation Congress.

Eighteenth Annual Session at Pueblo, Col., in September, 1910.

The National Irrigation Congress of the United States held its eighteenth annual session at Pueblo, Col., U.S.A., Sept. 26 to 30, 1910. About eight hundred accredited delegates were present. An exposition was conducted in connection with the congress, at which products of various irrigated districts, special machinery for irrigation farming, pumping machinery, etc., were shown.

The question of federal vs. state control of interstate streams was brought up, and as at the Conservation Congress at St. Paul, Minn., the advocates of federal control were again victorious.

Resolutions were passed affirming the primary uses of water to be for drinking and domestic purposes and for agriculture, the uses for navigation and power being secondary; deprecating the granting of perpetual licenses for water; affirming the necessity of the control of interstate streams by the federal authority and urging the creation of a federal bureau for stream regulation; commending the Reclamation Service, and also the Census Bureau in its collection of irrigation statistics; urging the reclamation of swamp lands by federal authority in co-operation with states and individuals; approving the project of a deep waterway from the Great Lakes to the Gulf of Mexico; commending the federal forest policy and repeating the declarations of former Irrigation Congresses in favor of the establishment of the Appalachian and White Mountain na-

tional forests, and favoring the passage of laws to regulate the cutting of timber and the reformation of the present schemes of taxation of forest lands.

The officers elected were as follows:—

- President, B. A. Fowler, Phoenix, Ariz.
- 1st Vice-president, F. W. Fleming, Kansas City, Mo.
- 2nd Vice-president, L. Newman, Havre, Montana.
- 3rd Vice-president, A. G. Watson, Pueblo, Col.
- 4th Vice-president, John Fairweather, Fresno, Cal.
- 5th Vice-president, B. C. Buffum, Worland, Wyoming.
- Secretary, Arthur Hooker, Spokane, Wash.
- Foreign Sec., Dr. E. McQueen Gray, Albuquerque, N.M.
- Chairman Exec. Com., R. Insigner, Spokane, Wash.

Chicago was selected as the place of the next meeting of the congress.

Messrs. R. H. Campbell, Superintendent of Forestry, and Ralph J. Burley represented the Dominion Government of Canada; J. A. McKelvie, of Vernon, B.C., the British Columbia Government, and R. H. Agur, Summerland, B.C., and W. H. Fairfield, Lethbridge, Alta., the Western Canada Irrigation Association. Representatives were also present from Australia, India, Russia, Austria-Hungary, Chile and Cuba.

STUDYING FOREST INSECTS.

The fortieth (1909) report of the Ontario Entomological Society is one of unusual interest to students of forestry. Separate papers are given on the Large Larch Sawfly (*Nematus Erichsonii*) by Dr. C. Gordon Hewitt, Dominion Entomologist; the Spruce Budworm (*Tortrix fumiferana*) by Mr. Arthur Gibson, Chief Assistant Entomologist, Experimental Farm, Ottawa; and the Snow-white Linden Moth (*Ennomos subsignarius*) by A. F. Winn, of Westmount, P.Q. Other insects mentioned as attacking the forests are the Spiny Elm Caterpillar (*Euvanessa antiopa*) and the Bronze Birch Borer (*Agrilus anxius*) in Mr. Gibson's report on insects in the Ottawa district, and the Tussock Moth by Mr. J. B. Williams in his report on insects in the Toronto district. Mr. L. Caesar, of the Ontario Agricultural College, has notes on an occurrence of the Terrapin

Scale (*Eulecanium nigrofasciatum*) and an unidentified species of *Pityophthorus*.

Work with the Brown Tail Moth is reported on by Mr. Gibson. The Shot-hole Borer (*Xyleborus dispar*) is treated by Mr. J. M. Swaine, of Macdonald College, P.Q., and Dr. C. J. S. Bethune, of the O. A. College, besides notes on the different forms of aphids, treats of the Cottony Maple Scale (*Pulvinaria innumerabilis*) and the Senatorial Moth (*Anisota senatoria*). Prof. Lochhead, of Macdonald College, P.Q., notes the occurrence of the American Tent Caterpillar and the Fall Webworm. The president of the society, Mr. T. D. Jarvis, of the O. A. College, has an exhaustive paper on the mite family, which includes the insects causing galls on forest and other trees; a list of host-plants is given, and the article is illustrated by several plates showing galls on the leaves of forest trees and shrubs.

INDIANS AS FIRE RANGERS.

'Should Indians be employed as fire rangers?' is a question which has been more discussed than most people think.

Recently two citizens well acquainted with New Ontario have discussed the subject. The first is Mr. J. H. McKinley, of Belleville, Ont., a well-known mining man in Northern Ontario, and the second, Ven. Archdeacon Renison, of the Church of England mission at Moose Factory on James Bay. Mr. McKinley in a letter to the Canadian Forestry Journal urges the protection of the forests we have rather than letting these be destroyed in the belief that new forests may readily be grown. As to forest protection up to the present he believes a great deal has been due to leading lumbermen like Mr. J. R. Booth, Gillies Bros., and Senator Edwards, who make a point of sending their most trustworthy men for this work. His observation leads him to believe it would be of great advantage to organize the Indians and to pay them for fire ranging. They would take a pride in their work. They do not go out for a season, but live all the year around in the unexplored or partly explored sections of the country, and by making the Indians responsible the timber in these parts would be protected until the country was ready to be opened up.

Archdeacon Renison, whose district, speaking roughly, covers the country from the Canadian Pacific Railway main line to James Bay, is a great believer in the future of this part of Canada. He wants to see the resources saved for those who will shortly live there, and in a recently published letter he says:

'The wave of conservation which is passing over America is visible in Ontario in the game laws recently passed and the fire protection which is being more or less wisely conducted by the Provincial Government. But it does seem that more wisdom might be shown in the method if not in the matter of this necessary legislation.

'Fire ranging (sic) is now in the hands of men who in many cases do not know a paddle from an oar or a birch from a poplar. The heavy blanket of smoke over this lake for the past few days witnesses the inefficiency of the present service.

'The Indians, whose future has troubled many of our economists, are ideal fire rangers. They may be ignorant of algebra and Demosthenes, but they could teach the tyros who are now playing with a great national institution many things.

'The Indian knows his country, its forests, its rivers and lakes, and their mysteries are an open book to him. Many of our industrial schools are teaching these children of nature to be third-class farmers and fourth-class clerks, and thus wasting specialized knowledge and hereditary instinct of the very first quality.

'The white man only goes into the bush

to save enough money to get out again. The Indian is at home here. I can imagine no more potent service to the cause of conservation than the establishment of a Government bush ranger corps, directed by forestry experts, the rank and file of which would be made up of Indians. Encouraged to preserve the game and forest, which they do naturally, an Indian for one-quarter the salary of a white man would thrive in a district of 100 square miles and be a valuable servant of the country.'

Others who have given attention to the matter are not at all sure of the success of such a plan. It depends, they think, on the Indian. It would be all right if the right Indian could be got, but many have so little idea of the value of time, or duty or responsibility, and such a marked dislike of regularity or routine of any kind, that they would be useless. The subject is open for discussion in the Canadian Forestry Journal by those who have had experience in the matter.



JASPER PARK.

Mr. D. J. Benham, of Winnipeg, writes in the Toronto Globe of Jasper Park and Forest Reserve on the eastern slope of the Rocky Mountains, which he visited in company with Mr. R. H. Campbell, Dominion Superintendent of Forestry, and Mr. Howard Douglas, Commissioner of Dominion Parks. The trip was made upon horseback, the party sleeping out at night, and occupied five weeks.

Mr. Benham describes the park as admirably suited for the purpose of a forest and game reserve. The animals which range in the park are mountain sheep (Rocky Mountain Big Horn), mountain goats, moose, elk, red deer, caribou, grizzly, black and brown bears and marmots. The park gets its name from Jasper House, a famous establishment of the Hudson's Bay Company in the early days, but now deserted. The Grand Trunk Pacific and Canadian Northern Railways will pass through the Park, the beauties and advantages of which will thus be thrown open to tourists.

Since the article was written the whole eastern slope of the Rockies has been made a forest reserve, but this will enhance the advantages of the park as it will make the area throughout which there will be additional protection for game so much larger.



AFRICAN FORESTS.

The report of the Chief Conservator of Forests of Cape Colony for 1909 shows an increase in revenue of nearly \$40,000 over the preceding year. The total revenue for 1909 was \$188,050, which was just about double that for 1899.

ONTARIO'S 'BEAVER FARM.'

The Ontario government this spring realized the sum of \$2,714.83 from the sale of beaver and other furs from Algonquin Park. There were in the lot 361 beaver skins, 9 otter and 14 muskrat pelts. Six hundred more beaver skins may be placed on sale soon. Under the policy of strictly protecting the beavers, the animals, from being almost extinct, have become so numerous as to be troublesome. The annual increase is estimated at five to ten thousand.

The first sale of beaver skins by the Ontario Government has taken place in consequence of an order of Hon. Frank Cochrane, Minister of Lands, Forests and Mines of Ontario, that the forest rangers in Algonquin Provincial Park and Game Reserve trap five hundred beaver per year.

Seventeen years ago, when the park was set aside as a game preserve, it was feared the beaver was extinct; but these animals have increased so rapidly in the interval that they now have become a nuisance to those in charge of certain parts of the park and also to settlers in the district adjoining. They cut down trees that it is desired should live and their dams cause the overflow of farming lands. Even railway tracks have been flooded by reason of the beavers stopping up the drainage culverts in order to make a pond.

After consultation with those in charge of the Park the Minister decided that, in the section where the beavers were most troublesome, five hundred per year might be killed without reducing the number below the safety limit. About two hundred were trapped last season after the order went into effect, and the skins were sold by public tender. Beaver skins are reported worth from \$8 to \$12 each, according to quality.

About a year ago Mr. Thomas Southworth, during his term as President of the Canadian Forestry Association, publicly advocated making Algonquin Park a 'fur farm,' and he estimated that without injury to the Park as a game refuge furs to the value of \$40,000 per year might be taken, which would go to defray the upkeep of the Park. A good many people (who, unlike Mr. Southworth, had not had ten years' experience in forestry) thought his ideas were impracticable, but events proved that the officers of the Provincial Crown Lands Department were thinking in the same direction, and the order of Mr. Cochrane and sale of furs shows that they have put the matter to the test.



'Conservation is not a fad, but a fight for the rights of future generations against the attacks of predatory wealth in the present.'—Dr. B. E. Fernow.

INVESTIGATION NEEDED.

(Engineering News, New York, Sept. 1, '10.)

The great western forest fires of the past two weeks seem like grim irony of fate. Hardly has the plea for careful husbanding of our timber resources won a country-wide hearing, when the destruction of the elements threatens to clear the problem off the boards by wiping out the chief remaining stands. This month's fires are the worst for many years, if present reports may be credited in full. In loss of life they make a new record, indeed, but this is in the main because such desperate attempts were made to fight the flames hand to hand. But while the casualties make the disaster so much worse, they are hardly a gauge of its importance in the records of forest fires. The significant point is that this month's fires, as well as those of a year ago, come upon the nation just at a time when the governmental forest administration has attained to an elaborate working organization, when virtually for the first time the chief areas of extensive forest are under thorough-going supervision and management.

* * *

And one thing before all should be gleaned from the forest ruins: more positive knowledge of the causes of origin of fires, so that efforts at prevention may become more effective. That prevention is the only cure in this matter needs no words, especially after the spectacle of the agonized waiting for rains as the only possible check to the fire advance in the Northwest last week. It has been stated often enough that negligence, wanton disregard of proper care, the ejection of fiery cinders along railways, etc., are partners in blame. But which were the causes in the present instance? Which are the most threatening? Where must the main efforts for reform be applied? Let these things be learned and the resultant facts spread wide and repeated among all the people; then we may have a chance for improvement. The officials are already at work, it seems, for it is reported that several persons are under arrest for criminal action in setting fires. Let the investigations be continued to bring out all attainable facts, so that the prospect of prevention may be brought within tangible distance.



FOREST FIRE INSURANCE.

In some provinces of Sweden mutual insurance companies have been formed for assuming risks against forest fires. Forest owners can now take out policies for the insurance of growing as well as mature trees, including indemnities against loss of timber kept in stock within a radius of half a mile from actual woodlands.

GROWTH OF POPLAR.

When the Secretary was in Newmarket, Ontario, he was shown by Mr. H. S. Cane, of the Wm. Cane & Sons Woodenware Co., the stumps of some trees that had made remarkable growth. These were silver poplars which had been planted seventeen years and which, when cut, had attained a diameter three inches above the grass roots of 22 inches. Mr. Cane managed to secure a section of the stump and sent it to Toronto. Owing to its having been cut so low and having been covered with snow all winter for several years and grass-shaded in summer, the stump was somewhat decayed, but a careful examination showed that the total age of the tree was about thirty years, it having evidently been a good-sized sapling when planted. The subsequent growth had been very rapid, in some years being over an inch. These poplars were planted in the open as shade trees, and thus branched out low and did not make a clean log. Mr. Cane, however, made part of the bole of one of them up into pails, a sample of which was placed in the Forestry Faculty Museum at Toronto University.



FOREST FIRES AT CLOSE HAND.

How bad the forest fires of this year have been in the Rainy River district is shown by a few extracts from a letter of Dr. Lofthouse, Anglican Bishop of Keewatin, to the Canadian Churchman, regarding a trip to that part of his diocese. 'We drove six miles through a burnt country, with nothing but corduroy roads, which had nearly all been burned,' Dr. Lofthouse writes. 'The six miles drive took us over two hours, and when we arrived (at Cook's Mills) fires were raging all around us; most of the people were fighting them for their lives. . . . We had to take another road back and passed over about three miles of bad corduroy with fires burning all around.' On going into Rainy River by train, Dr. Lofthouse states that high speed had to be put on to escape the fires, and he adds: 'Fierce forest fires were burning all around the town; many of the people had all their things packed ready to flee for their lives, and it did seem as if the whole town must be destroyed, but fortunately the men, who were all out fighting fire, were able to keep it in check.'



MELTING WOOD.

By excluding oxygen, under the pressure of two atmospheres and a temperature of 800 to 900 degrees (C.) wood can be melted, making a compact amorphous mass which can be cast into forms. By adding preservatives it can be made indestructible.—Bulletin de la Société Centrale Forestiere.

THE SILVER BIRCH.

Jean Blewett.

—

Back from the highway, my lady of dreams
Murmurs a roundelay tender:
Silence and fragrance, and flowers and
streams,
These do you sing of, my lady of dreams,
Standing so stately and slender.

Silvery white where the lone shadows brood,
White where the starlight is streaming,
Silvery white through your virginal snood,
Silvery white through your veil and your
hood—
You, with your singing and dreaming.

You, with a cloak of the loveliest green
Draping your warm whiteness over;
You, with the breath of the forest, I ween,
Mosses and briars with lilies between—
Haunts of the poet and lover.

Back from the highway, my lady of dreams
Murmurs a roundelay tender:
Silence and fragrance, and flowers and
streams,
These do you sing of, my lady of dreams,
Standing so white and so slender.



ENFORCING ONTARIO'S FIRE LAWS.

One Northern Ontario guide was summarily punished a few weeks ago for carelessness in not extinguishing a camp fire. While Hon. Frank Cochrane was, during the course of his tour in Northern Ontario, proceeding along the Nipigon River, he met a party of American tourists, and shortly afterwards landed at their last previous camp-site. Here, in spite of the fact that one of the provincial fire notices was near at hand, the camp fire was found still smouldering. The chief ranger accompanying the ministerial party was at once sent back after the party of campers, with instructions to cancel the license of the chief guide of the party and warn the other members of the party that the offence, if repeated, would mean the cancelling of the licenses of the other guides and the permit of the tourists.



The town of Minnedosa, Man., is making good progress with its power plant. The power is developed from the Little Saskatchewan river, whose headwaters, it will be remembered, are in the Riding Mountain Forest Reserve.

* * *

Several timber licenses in B.C. have been cancelled because the holder exported logs to the U.S. contrary to the provisions of the Timber Act.

The Quebec Convention Programme.

The following is the programme for the Forestry Convention at Quebec, Jan. 18 to 20, 1911, as far as it can be formulated at present:—

WEDNESDAY, JAN. 18, 10 A.M.

Sir Wilfrid Laurier, Prime Minister of Canada, will take the Chair and the Convention will be opened by His Excellency the Governor-General. Addresses of welcome will be delivered by Sir Lomer Gouin, Premier of Quebec, and His Worship the Mayor of Quebec. Short addresses expressive of co-operation in the movement by Mgr. Roy, representing His Grace the Archbishop of Quebec, Right Rev. Hunter Dunn, Bishop of Quebec, Hon. Clifford Sifton, Mr. R. L. Borden, M.P., and the official representatives of the various provinces, the United States, Universities, Finance, Commerce, etc.

WEDNESDAY, JAN. 18, 2 P.M.

In the absence of the Premier at any time during the Convention the Chair will be taken by Hon. W. C. Edwards, President of the Canadian Forestry Association.

Appointment of Resolutions Committee.

Address by Hon. Clifford Sifton, Chairman of the Commission of Conservation.

FOREST ADMINISTRATION.

Addresses by

Hon. Jules Allard, Minister of Lands and Forests, Quebec.

Mr. R. H. Campbell, Dominion Superintendent of Forestry.

Mr. H. S. Graves, United States Forester, Washington.

Hon. F. Cochrane, Minister of Lands, Forests and Mines, Ontario.

Hon. A. K. Maclean, Commissioner of Lands, Nova Scotia.

Hon. W. C. H. Grimmer, Surveyor General, New Brunswick, and others.

WEDNESDAY, JAN. 18, 7.30 P.M.

Banquet tendered visiting dele-

gates by the Premier and Government of Quebec.

THURSDAY, JAN. 19, 10 A.M.

Address by Hon. Sydney Fisher, Minister of Agriculture for the Dominion of Canada.

PROTECTION AGAINST FIRE.

Papers by

Mr. W. C. J. Hall, Supt. of Bureau of Forestry, Quebec.

Mr. E. E. Ring, Forest Commissioner, Maine.

Railway Representatives.

Mr. E. G. Joly de Lotbinière.

Report of Committee on Fire Laws.

THURSDAY, JAN. 19, 2 P.M.

LUMBERING REGULATIONS.

Addresses by several lumbermen and limit-holders; also by Mr. G. C. Piché, Chief Forestry Engineer, Quebec.

THURSDAY, JAN. 19, 8 P.M.

FORESTRY EDUCATION.

The Rector of Laval University.

Dr. B. E. Fernow, Dean of Faculty of Forestry, University of Toronto.

Dr. C. C. Jones, Chancellor of the University of N. B.

Mr. Avila Bedard, Prof. of Silviculture, Forest School of Laval University, Quebec.

INJURIOUS INSECTS.

Illustrated lecture by Dr. C. Gordon Hewitt, Dominion Entomologist.

FRIDAY, JAN. 20, 10 A.M.

Waterpowers of Quebec, Arthur Amos, C.E., Provincial Hydraulic Engineer, Quebec.

Waste Land Planting. Paper by Mr. E. J. Zavitz, Forester to the Ontario Dept. of Agriculture.

Report of the Resolutions Committee.

FRIDAY, JAN. 20, 2.30 P.M.

Trip to Montmorency Falls.

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C. C. JONES, Chancellor

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For further information address

JAMES W. TOWNY, Acting Director
NEW HAVEN CONNECTICUT

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